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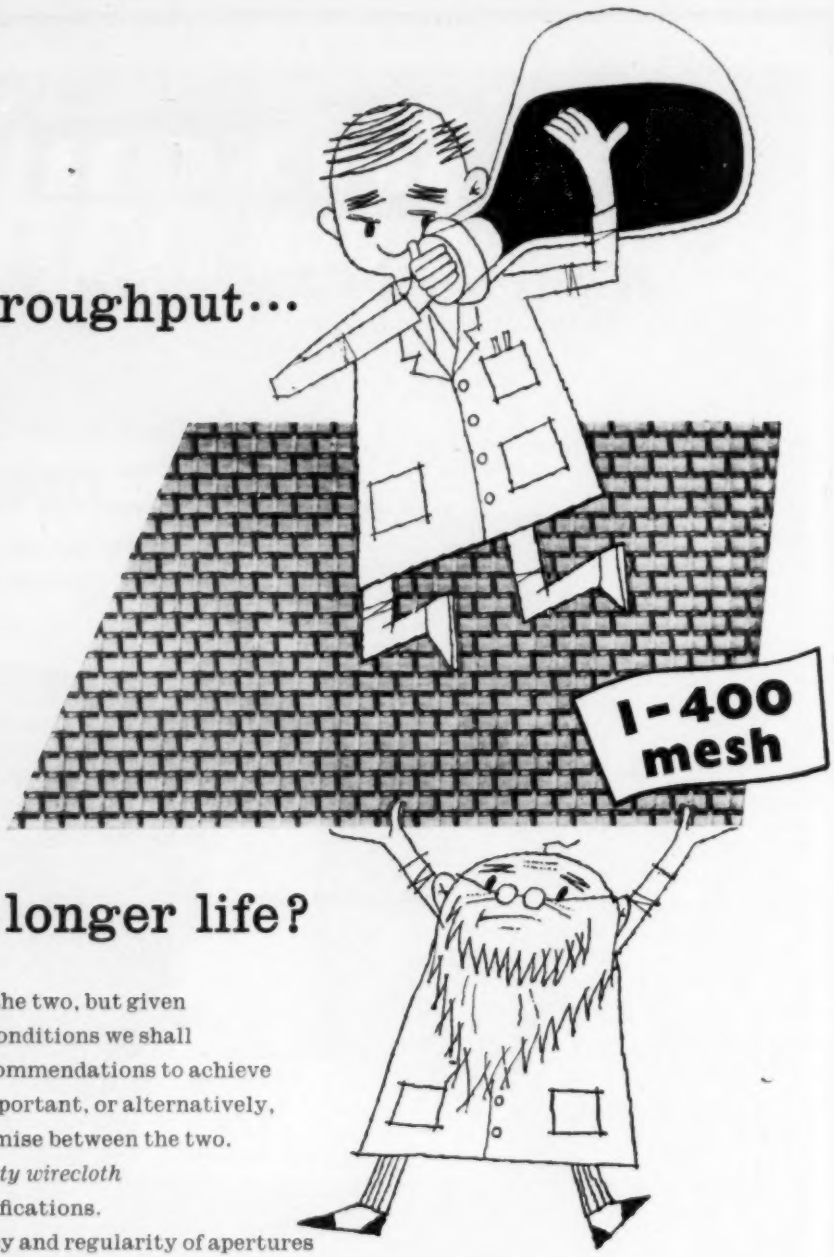

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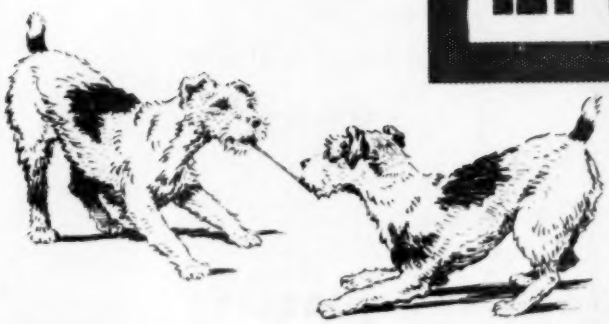

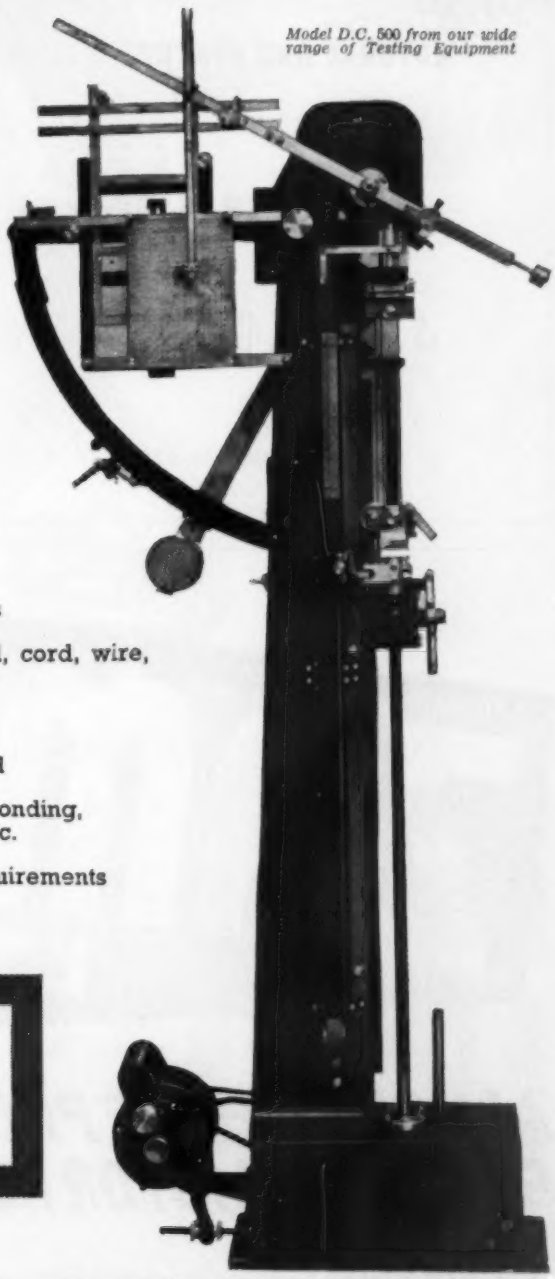

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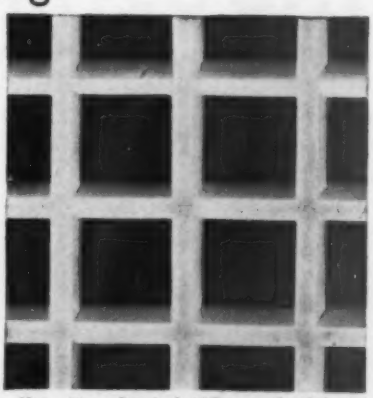

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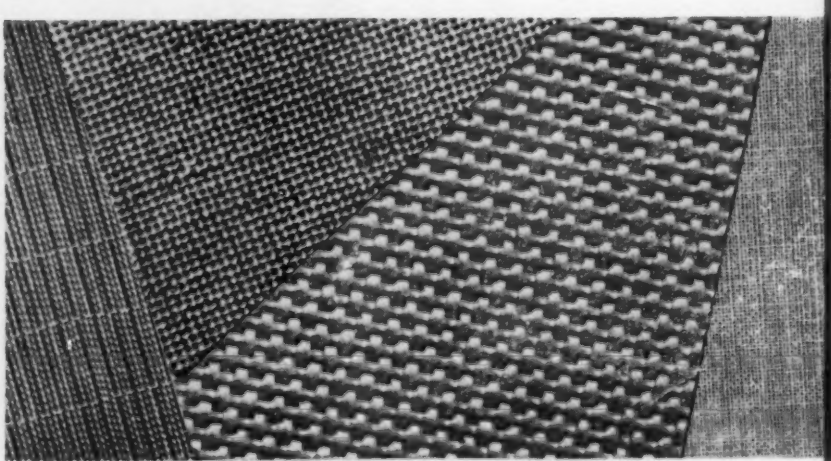

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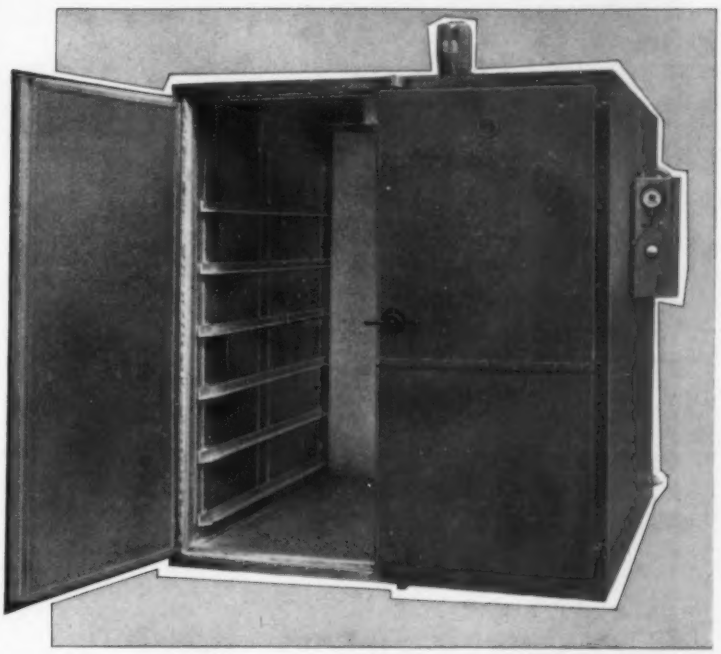

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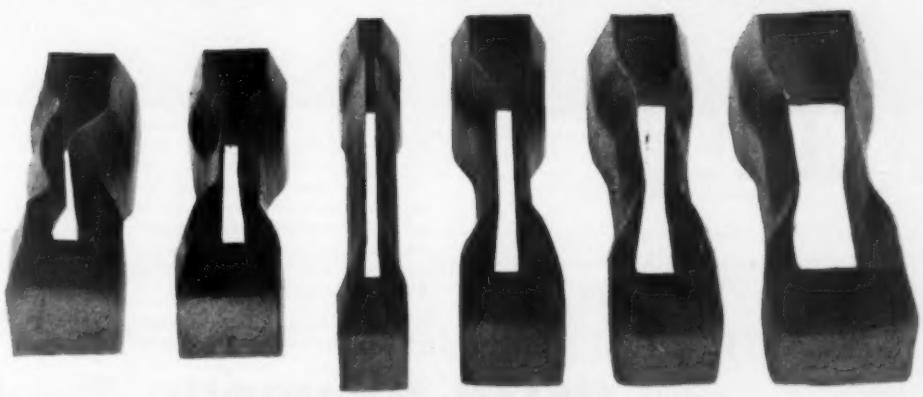

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Volume 139 Price 1s. Post free 1s. 4d. No. 1
IN ITS 76th YEAR
July 2 1960

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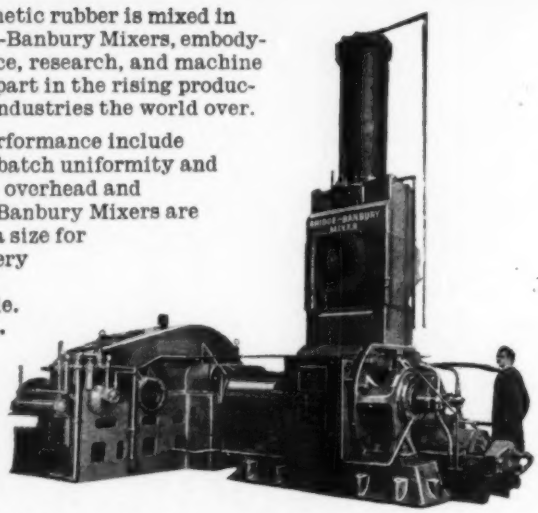

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NOTES of the WEEK

Synthetic Scene

THE so-called 'synthetic natural' rubbers are again in the news this week with the announcement that the Societe des Elastomeres de Synthese is to build a polybutadiene plant in southern France. The Royal Dutch Shell Group has an interest in this company. Previous announcements of the projected manufacture of these new rubbers have come from Shell Chemical, who will also use processes developed in the Royal Dutch Shell laboratories in a major investment at Carrington, and Chemische Werke Huls, who will use a process involving Ziegler catalysts. Goodrich-Gulf announced in April that they will be producing polyisoprene and polybutadiene, which will be marketed in the UK.

The fact that three major tyre manufacturers are associated with Societe des Elastomeres reinforces previous indications that most of the new rubber will find an immediate outlet in tyres. Fairly extensive road tests in America are said to have shown a number of advantages. Qualities claimed are improved abrasion resistance and resistance to heat build-up, and it is expected that the polydienes will be able to replace at least 50% of the natural rubber used in tyres.

Expectations

IT will be easier to predict the effect of the new rubbers on natural consumption—and on conventional synthetic consumption too for that matter—after the October Congress in Berlin. The Congress promises to be one of the most interesting conferences that has been held for some time, and will place considerable emphasis on the new rubbers.

As the price of natural rises, so do synthetic rubber plants. The world consumption of rubber at the present totals about 3.9m. tons—and half of this is synthetic. In USA 66% of the demand is satisfied with synthetic, and many experts would put the optimum amount of rubber requirements that can be met by synthetic at 70%. But if the polydienes come up to expectations this figure will have to be revised.

The Exploding City

THERE is one problem that affects every field of industry: where to expand. Since it is a growth industry, the polymer field probably feels this as acutely as any. Recently *The Observer* carried a series of articles called 'Must Britain be a Mess,' which calls attention to the fact that, quite simply Britain *is* a mess. We are now just beginning to face up to the appalling consequences of hapazard building, of ribbon development and sprawling cities. 'The old cities,' one of the articles runs, 'are tending to explode over the countryside, leapfrogging the green belts, gradually making nonsense of existing planning machinery . . .'

Every day space has got to be found for 750 new houses and 2,000 new cars which pour out onto the roads, quite apart from the industrial development which is vital to the country's future economy—the polymer industry alone is connected with investments announced this year that must run to £25m. It would be better for everybody if these and other developments could be fitted into a general plan. As it is, the existing Acts are totally inadequate to deal with the situation. No-one likes to be controlled. But it is better to have a measure of it now than the stringent actions that will have to be taken if the problem is left too late.

Robot Problems

GRAVE new problems of the relationship between employers and unions are created by the 'Transfe-Robot,' a robot which can replace a manual worker for certain simple tasks. On sale in America, it consists essentially of an electronic computer and a mobile claw, which can grab, twist and release. The first model can pack rubber washers, for instance, or assemble caps on the ends of short lengths of polythene pipe. To teach the robot a new operation all that is necessary is for someone to move the claw through the exact sequence required. The computer records the movement and can reproduce it any number of times.

The problem, of course, for the unions is—how do you bring a robot out on strike? How do you get him to pay his union dues—and if you do manage this, is he, or it, then entitled to a vote? Knowing the versatility of the unions, I am sure that this problem will not defeat them for long. The main answer will be—electronic shop stewards. In no time at all the RWAUEUAW — Robot Workers Association and Union of Electronic Units and Allied Workers—will be formed. This body will make sure that every robot's claw has gone through a go-slow sequence before it is allowed on the shop floor. Lightning strikes will, of course, present no difficulty. Union dues will be paid in pulses. And, as for elections, no new technique will be required; candidates will shake hands with the robots, just as they have always done.

NEWS *Briefs*

ALLIED STEP UP ISOCYANATE PRODUCTION BIIC GET FURTHER INDIAN ORDER — BLACK PLAN IN VENEZUELA — GHANA CO-OPERATIVES

●**United States**—Plans to more than treble the production of isocyanates have been announced by Allied Chemical. The expansion will necessitate a multi-million dollar investment in new construction and equipment at Moundsville, W. Va. Actual construction of new facilities will begin immediately and will be completed in mid 1961. The bulk of the isocyanates will be used in the manufacture of polymethane foam.

●**Northern Ireland**—Du Pont's Maydown plant will be in full production next month. It will produce 5m. lb. of neoprene a year and will be formally dedicated on July 26, said Crawford H. Greenwalt, president of the parent company.

●**India**—A further contract for the supply and installation of overhead equipment for railway electrification has been awarded to the British Insulated Callender's Cables group by the Indian Railway Board. The work is valued at £1.2m. and covers some 300 track miles of the Eastern railways system. The route to be equipped is on the main Delhi-Calcutta line.

●**Malaya** — Dunlop Rubber Co. (Malaya) Ltd. has announced a further expansion of its Dunlopillo factory in Negri Sembilan. It is the fourth expansion since the factory went into production in 1956 and total investment in the factory now exceeds $1m. The factory was established in Malaya as a means of bringing down the price of Dunlopillo. Production has increased five times since 1956 and the factory now exports throughout South East Asia.

●**United States** — American and Foreign Power Company Inc. is considering a joint venture with the United Carbon Co. to build a carbon black plant in Venezuela, Mr Henry Sargent, president, told a regional meeting of stockholders. This would be a first step in a new diversification policy of the public utility holding company.

●**Ghana** — The United Ghana Farmers' Council is reported to be planning the establishment of four rubber co-operative farms at Enchi, Abura, Dompen and Manso, in the Western Region, aimed at encouraging farmers to work on a co-operative basis. The initial capital to clear the land, buy equipment, and build houses for the farmers will be provided by the Council, while rubber seedlings will be provided by the Department of Agriculture.

●**Nicaragua**—A plant for the manufacture of plastics pipe and hose and polythene bags for packaging will soon start operating. It is a subsidiary of two Mexican plastics manufacturers.

●**United States** — Mobay Chemical's polycarbonate resin plant at New Martinsville, West Virginia, is now on stream. It is expected to reach a capacity production of 5m. lb.

●**France**—Trading in the shares of I.C.I. on the Paris Bourse Courtiers (unofficial) market will start this month, according to the chairman of the Brokers' Association. This follows recent approval by the Finance Ministry.

●**Western Germany** — A Hamburg rubber company, Phoenix-Gummiwerke, is to enter into 'close technical and commercial co-operation' with the French concern Industrie du Caoutchouc Souple. Tyre production is to be excluded from this agreement.

●**Pakistan**—Pakistan's import policy for July/December 1960, just announced, places some raw materials and consumer goods on virtual general open licence. Items now on the automatic approval list include synthetic and scrap rubber, tyres and tubes and various appliances made of rubber.

●**United Kingdom**—The production of 51.99m. lb. of man-made fibre in May was a record for the month, states the British Man-Made Fibres Federation. Output was 257m. lb. in the first five months of this year, compared with 198m. lb. in the same period last year.

●**Puerto Rica** — Union Carbide are planning to build a polythene plant at Ponce. The plant, which is expected to be completed by 1962, will have a capacity of 110m. lb., a large proportion of which will be exported. Union Carbide already produces ethylene oxide and ethylene glycol at Ponce.

●**Japan**—A spokesman for the Japan Bicycle Tyre Manufacturers' Association said that Japan could find an annual market for two million bicycle tubes in USA — providing manufacturers cut their export price.

'Course he ain't a real doctor — some sort of quack I reckon!'—491

Polybutadiene Plant in France

25,000 TONS ANNUAL CAPACITY

A POLYBUTADIENE plant with an annual capacity of 25,000 tons will be built at Berre, in Southern France, by Société des Elastomeres de Synthese, a French company formed by the Royal Dutch Shell Group in association with Cabot Texas Butadiene and three leading tyre manufacturers—Michelin, Dunlop and Kleber-Colombes.

The announcement was made in Paris by the board of Société des Elastomeres on June 24. They decided to raise the company's capital to 42 million new francs from two million, and to include the construction of the polybutadiene plant in the programme.

The company was formed early last year for the purpose of building an SBR producing plant at Berre, where Shell has one of its French refineries. This plant will start production next year. It will have a capacity of 50,000 tons.

One of the First

The projected Berre polybutadiene plant will be one of the first of its kind in Europe. Previous announcements of plans for the manufacture of polydiene rubbers have come from Shell Chemical (a 'large investment' is to be made at Carrington) and Chemische Werke Hüls (*RJIP* February 27, 324). Goodrich Gulf of Cleveland, Ohio, is to produce polybutadiene and polyisoprene, which are to be marketed in the UK (*RJIP* April 9, 533).

LOCKHEED OPEN £1m. PLASTICS PLANT

Lockheed Aircraft Corporation's California division has opened a new £1m. plastics centre in Burbank, California, to expand development and manufacturing work in the plastics field.

'The potential of plastics has barely been tapped,' said Mr M. C. Haddon, vice-president and general manager of the California Division. 'Our objective in stepping up the division's plastics manufacturing capability is to build a complete, diversified activity that can find new applications and markets.'

One of the company's new plastics products is a 'flame shield' designed to protect the main body of high-speed missiles against heat generated by the missile's engine. The shield is made of layers of glass fibre cloth, laminated by resin, that ablates (or dissipates) heat. In flight each layer burns or chars separately, without flaming, and provides insulation for the layer directly beneath.

Plastics Show of Canada

A plastics exhibition will be organized in Canada next year by the magazine *Progressive Plastics*. The exhibition will be called the Plastics Show of Canada and will run from October 17-19 in Toronto.

Some 15,000 manufacturers are expected to attend during the three-day period. Heavy attendance is predicted from manufacturers of consumer products and it is expected that exhibitors of new-type plastics containers will receive special attention from visitors connected with the food and beverage industry.

Argentine Firm Expands

One of two loans granted by the Export-Import Bank of Washington to industrial enterprises in Argentina has gone to a rubber firm.

The firm is Neumaticos Goodyear SA, a subsidiary of Goodyear Tire and Rubber Co. of Akron, Ohio.

The five-year loan of $1,800,000 will be used by the company to expand the capacity of a Buenos Aires tyre factory.

CHANGE IN US STOCKPILE POLICY

The General Services Administration has announced new terms for the sale of rubber from the US stockpile. These are designed to overcome some of the disadvantages at present involved in buying from the stockpile instead of on the open market.

The main innovation is a discount of $\frac{1}{8}$ cent per lb. below the market price which GSA will be offering on the sale of all types of rubber, and which it hopes will compensate for the cost to the buyer of treating stockpile rubber which has been kept in cold storage for a long period.

GSA's previous offer to sell 20,000 tons of Grade 1 rubber 'as is' (that is to say, without guarantee of quality or grading) at $\frac{7}{8}$ cent below the market price has now been withdrawn and instead it has announced that all future sales of sheet rubber will be subject to a guarantee.

A spokesman explained that GSA under the new programme expected to bring cost of buying stockpiled rubber close to the price paid for fresh natural rubber. The stockpiled rubber was at a disadvantage because buyers had to process their purchases in order to make the rubber suitable for manufacture into rubber products.

GSA has sold 70,000 tons of rubber since it began to dispose of its stockpile last year and has 400,000 tons more to sell which it hopes to market gradually over the next eight years. This stock consists of 200,000 long tons of No. 3 RSS rubber, 100,000 tons of No. 2, 70,000 tons of No. 1 and 30,000 tons of pale latex crepes.

Steps to Face Competition

Additional funds will be required by SA des Pneumatiques Dunlop, the French subsidiary of the British firm, to maintain its leading position on the French market in view of prospective competition from two American firms, the chairman told the annual meeting. The two firms —Firestone and Goodyear—are now building rubber and tyre plants in northern France.

The chairman said the company will issue a 20m. new franc debenture loan this year and asked shareholders to approve an increase in capital up to a total of 100m. new francs. He added, however, that the Board would not increase the capital this year. The authorization would be valid for the next five years.

Development plans outlined were: the modernization of the Moutlucon plant and expansion of the Amiens plant to allow increased tyre production; expansion of Dunlopillo and synthetic foam rubber production at Mantes and modernization of the equipment of the Bourget plant, which produces tyres.

Mexican Promotion

Mexico's Minister of Agriculture has stated that the current deficit in rubber production necessitated the importation of 250m. pesos worth of this product annually.

The planting of rubber trees is being actively promoted at the rate of some 3,000-4,000 Ha. (7,500-10,000 acres) a year and, if this endeavour continues, Mexico should be able within five years to produce half the rubber needed to supply home consumption.

Plastics at Work

POLYPROPYLENE FOR PLANT CONSTRUCTION

By DAVID ALEXANDER

THE theoretical possibilities of polypropylene have been widely known for some time and a swing has already developed from polythenes and high density polythenes to polypropylenes, particularly in injection mouldings where rigidity or sterilization at high temperatures are important. For some months reports have appeared of mouldings made from this material, but the amount of information available on the working of this plastic for welded plant and equipment has been very limited. In this respect an exhibition organized by British Celanese Ltd. was most opportunely timed, particularly as it concentrated on showing plant and equipment of welded construction. It was in effect very much a practical engineers guide to the use of polypropylene.

Before describing the working and handling of polypropylene it is as well to examine the simple physical properties in relation to ordinary polythene and high density polythene, and Table 1 gives a comparison of properties of typical materials.

TABLE 1

	High Density Polythene	1972 Polythene	Polypropylene
Mechanical Properties			
Density (g/cc)	0.94	0.92	0.91
Tensile Yield Strength (psi)	2750	1490	4200
Elongation (%)	300–800	300–550	350–600
Thermal Properties			
Specific Heat at 40°C. (Cal/g/°C.)	0.59	0.55	0.46
Melting Point-Crystalline (°C.)	125	111	166
Linear Co-Efficient of Expansion (cm/cm/°C.)	16×10^{-5}	28×10^{-5}	11×10^{-5}
Electrical Properties			
Volume Resistivity (Ohms/cm.)	10^{18}	10^{19}	5×10^{16}
Surface Resistivity (Ohms)	10^{12}	4×10^{14}	10^{15}
Dielectric Strength (volts/mil.)	1000	1000	800
Power Factor at 10^6c.p.s.	0.0005	0.00011	$2–3 \times 10^{-4}$

Two facts useful to the engineer emerge from the above table. The density is less than other plastics, and the melting point is higher. This makes possible the construction of light yet strong structures such as fans, tanks, and ducting for operation at higher temperatures than other thermoplastics in practical everyday use. A fume hood and bend of welded construction with welded flanges and a welded transformation piece made from polypropylene is shown in Fig. 1.

Methods of Fabrication

Polypropylene can be heat formed, bent, cut, sawn, drilled and planed in the same way as polythene and PVC, with slight variations in individual techniques to suit the particular material.

Bending

The techniques for bending polythene and PVC can in principle be used with polypropylene and it is now possible to use special jigs such as those made by Hans Biel which can be used for both forming and butt welding not only of polypropylene but of other sheet. There is no doubt that for the engineer engaged in large-scale production of ducting these jigs can considerably reduce time and the number of welds. There is a certain view that apart from the butt weld carried out by the use of the hot plate in the Hans Biel process an additional weld by welding torch is advisable, but even allowing for this the time is much less than for traditional methods of heat forming and welding.

Cutting

Polypropylene may be cut on a guillotine for thicknesses up to $\frac{1}{8}$in. without difficulty and if jigged carefully up to $\frac{1}{4}$in.

Sawing

In sawing, blades with 8 to 10 teeth per in. are preferable but it is also possible to use a saw similar to that used for cross cutting of wood, although the sheet must not be forced against the blade too hard.

Drilling

Drilling can be carried out by both hand and power operated drills, and the best results are obtained with an increased rake on the flutes to reduce the possibility of snatch, although this danger is not as great as with polythene. If large diameter holes are being drilled then a speed of approximately 800 to 900 rpm is recommended. Above about 1in. diameter a trepanning tool should be used. If necessary a coolant such as soapy water or air can be used to reduce the build-up of frictional heat.

Welding

The technique used for welding polypropylene is in principle the same as that used with PVC and polythene, *i.e.*, the use of a hot gas torch. The normal inert gas is nitrogen which eliminates any danger of surface oxidation of the sheet. The new form of electrically-heated torches with built-in filler rod guide operate on compressed air and although this may not be recommended in principle, the speed of the weld is approximately 10 times that of the normal gas torch and the incidence of oxidation is greatly reduced.

The welding rod normally used is $\frac{1}{8}$in. diameter supplied in loose coils. The coil is cut into suitable lengths, dried, and degreased with a solvent such as trichlorethylene. The edges to be welded are dressed as with polythene or PVC, the angle of chamfer depending on the thickness of sheet, 60° being satisfactory for $\frac{1}{8}$in. material.

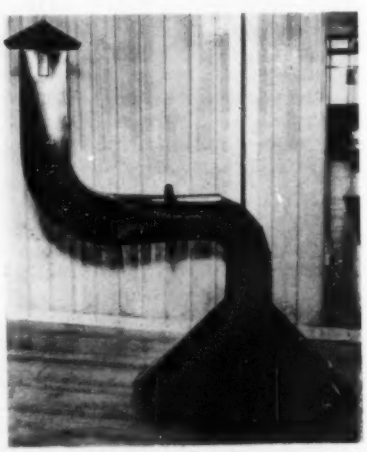

Fig. 1. Fume hood and ducting for chemical plant, made in Propylex polypropylene sheet, which is highly resistant to corrosion and chemical attack

The gas temperature should be 350-400°C. and the supply should be approximately 25 litres per minute.

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The process is carried out in much the same way as with polythene. (See Fig. 2.) In view of the fact that the welding is taking place at a higher temperature than with ordinary polythene, sufficient heat must be played round the weld area and the welding rod, otherwise cold inclusions will result. As can be appreciated, any such outside influences such as a draught will affect the quality of the welding. Once the technique has been properly acquired a welding rate up to 10in. a minute is possible, but the normal maximum for operators is 6 to 7in. per minute. After the weld is completed it can be filed and dressed but this will reduce the overall strength. Under ideal conditions a weld strength of up to 90% of the sheet can be obtained. Certainly between 80 to 90% efficiency is standard practice and if an operator does not produce welds of this quality then he is not satisfactory for this type of work.

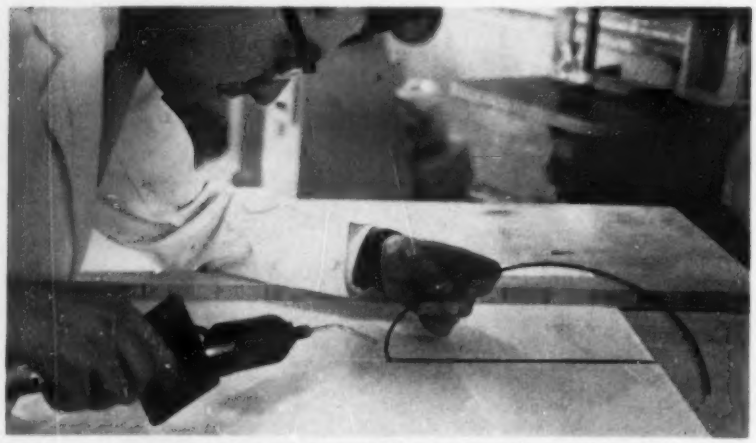


Fig. 2. A demonstration of welding techniques for polypropylene sheet. Note the angle of the welding torch and filler rod

The technique for joining the filler rod is the same as with ordinary thermoplastics with the usual overlap.

New types of torch are now on the market, some of which are able to weld at speeds of up to 40in. a minute which is considerably in excess of the speed obtainable with an ordinary hot gas torch. With some types of welding torches it is possible to hold the torch and the welding rod with one hand leaving the operator free to hold components in position. At the exhibition there was a very interesting and impressive demonstration of welding with one of these new torches, in this case supplied by Goodburn Plastics Ltd. Units of this type are, however, much more expensive than ordinary welding torches (£35 as against £7-£8), and it may be argued that the use of compressed air against nitrogen is a weakness in spite of recommendations that have been made to the contrary.

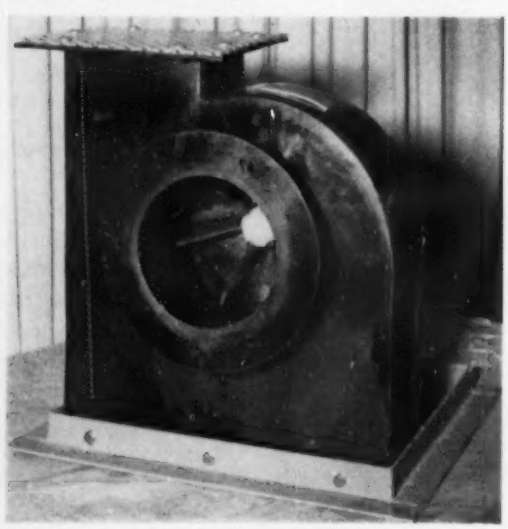


Fig. 3. Corrosion resistant booster fan in Propylex. Both the casing and the fan itself are made from polypropylene sheet

Resistance Tape Welding

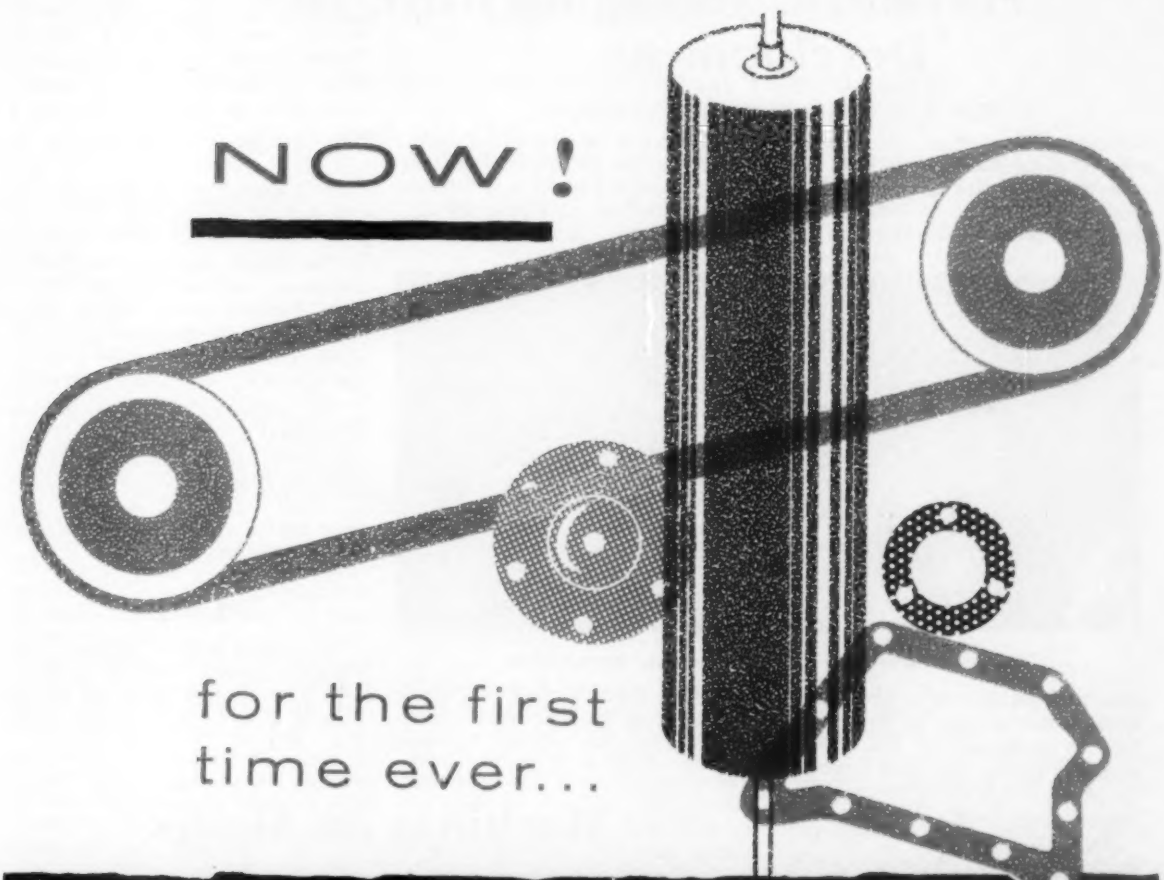
A fascinating technique for welding polypropylene was shown at this exhibition where a metallic strip bonded to an adhesive tape is laid over the weld area of two thin plastic sheets. The two ends are then connected to an electrical current for a fixed period, the heat produced making a weld which, when combined with one weld on the opposite side, makes possible the assembly of structures which are entirely satisfactorily welded and leakproof. These tapes are available in 20 different dimensions and can be used under certain conditions on material up to $\frac{1}{8}$in. The technique may also be used for other thermoplastics.

Complicated structures have been made from polypropylene, and in Fig. 3 is illustrated a centrifugal fan unit in which both the casing and the impeller are entirely made from polypropylene. Also on show was a complete plating bath and fume extraction fan from polypropylene which was operating with the bath at 100°C.

Fig. 4. Chemical process tank in polypropylene reinforced externally with polyester glass fibre

Another point of very great interest at the exhibition was a polypropylene glass fibre tank shown in Fig. 4. There were many other examples of tanks fume ducting, hoods and equipment and there is no doubt that polypropylene will have a great future under corrosive conditions and that the British Celanese Ltd. Exhibition was the first practical example to the works engineer of just what can be done with this material.

Sir George Dowty, chairman and managing director of the Dowty Group, has been elected president of the council of the society of British aircraft constructors.



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Polyamide Packaging Development

NEW 'COOK-IN-THE-PACK' TECHNIQUE

A POLYAMIDE packaging film which remains equally stable in boiling water and deep freeze is now being marketed by Whiffen and Sons Ltd. at Loughborough. It is called Ralsin—and is said to be suitable for the packaging of fish, cheese, sausages, bacon, ham, and especially foodstuffs which are to be cooked or heated in the pack.

The new film used for 'cook-in-the-pack' kipper fillets

Ralsin is claimed to be the only single film with properties capable of fully exploiting the 'cook-in-the-pack' technique.

The film is chemically inert, and is completely unaffected by bases or hydrocarbons, oils, fats or greases and any chemicals normally contained in foodstuffs. It is non-toxic—it contains no plasticizers or fillers—and is stable over a very wide range of temperature. It is said to perform excellently in deep freeze conditions, and remains flexible at temperatures as low as −40°C. The melting point of Ralsin (186°C.) enables the film to withstand temperatures in excess of the boiling point of water for long periods. It is therefore possible to sterilize the film at temperatures up to 130°C. for 30 minutes.

Packs made from the film can be clearly printed. Film up to 10/100mm. thick may be sealed by thermal impulse and infra red; thicker film may be sealed by high frequency.

The film has a tensile strength of 9,000-10,000 psi and a high elongation at break (250-400%). It is suited to vacuum packing and packing under nitrogen as required. The permeability to nitrogen is 0.002 x 10^{-9} cm.^{3} of dry gas passing per cm.^{2} of film surface per cm. of film thickness per second under a differential pressure of 1cm. of Hg. at 20°C.

Whiffen and Sons Ltd. are sole agents for Ralsin in the UK, Canada, Australia and New Zealand. Made-up pouches are already available through Felber Jucker and Co. Ltd., who are the first appointed converters.

Ralsin is manufactured under licence from the French concern Société Organico. The raw polymer is built up from glycerides of ricinoleic acid, which are extracted from castor oil.

Utrecht Plastics Exhibition

The second International Plastics Exhibition will be held in Utrecht from October 19-26 and is being preceded by a congress given the name International Congress 1960 on the Technology of Plastics Processing.

The exhibition will occupy an area of 400,000 sq. ft., a considerable increase over the 1957 exhibition which attracted nearly 50,000 visitors from 22 countries, and it is hoped that these figures will be considerably exceeded this year.

PI AGM

The annual general meeting of the Plastics Institute will be held at 2.15 p.m. on July 19 at the British Plastics Federation, 47/48 Piccadilly, W.1.

Machines on Skates

COMPLETE MOBILITY IN CONJUNCTION WITH RUBBER MOUNTING

TO make it easier to re-position machines on the factory floor, Vulcascot have introduced 'Vulca-Skate.' This is an accessory that can be used with most types of machine fixings, but is particularly designed to be used with Vulcascot's 'Level-Mounts.'

The latter consists of a bolt which is passed through the fixing hole in a machine foot and has a coned end which registers in the top plate of an anti-vibration pad. The underside of this pad is faced with ribbed, oil-resistant rubber which grips the floor; the height of the machine is levelled by adjusting two nuts on the bolt. This means that only the rubber anti-vibration pad is in contact with the floor. Noise, shock and vibration are absorbed, and these mounts have become widely accepted by industry since they were introduced two years ago.

The skate consists of a heart-shaped plate, on the underside of which are mounted three ball bearing castors. To put the skate in position the machine foot is raised some 3in. and the skate slid under it. The skate can now take the weight of the machine while the level-mount is moved to a new location. The

machine is now mobile. It can be rolled forwards, backwards, sideways or rotated on its own axis. Each skate can take a weight of 1½ tons, which means that a six ton machine can be moved with a skate on each foot.

Organotin Elastomers

HIGH TEMPERATURE RESISTANCE POSSIBILITIES

CONSIDERABLE research effort has been and is being made, both in this country and in the US, to find new rubber-like materials containing tin. Most elastomeric materials contain carbon or silicon, both belonging to group IV of the periodic table, and it would be not unreasonable to expect that tin, also a group IV element, would form organic derivatives capable of conversion to elastomers. It is expected that the new compounds will have good high temperature resistance, and be able to withstand the attack of corrosive chemicals better than conventional rubbers.

Work in the UK is being done by the Tin Research Institute and some promising results have been obtained, although as the evaluation of these is not yet complete, it is not possible to say whether any of the products made is likely to be of outstanding industrial importance. In the US, however, several papers have been published and a summary follows of a paper presented at the International Rubber Conference in Washington in November 1959, by members of the Quartermaster Research and Engineering Command, US Army.

Synthesis of Organotin Monomers

Tributyltin Methacrylate (TBTM). To 207.6 grams of tributyltin oxide in 600ml. of benzene in a flask equipped with reflux condenser and stirrer was slowly added 60 grams of methacrylic acid. Cooling was employed during the acid addition to prevent a temperature rise to more than 25°C. The mixture was then warmed gradually and maintained at 30°C. throughout the reaction period while vacuum was used to remove the water as reaction product. Any loss of benzene in the process was replaced through a dropping funnel.

When the solution became clear, the reaction was continued for one more hour (total reaction time, five hours). All the benzene was then evacuated. The resulting pale yellow viscous liquid was diluted with 200ml. of petroleum ether and cooled to −20°C. The product separated as long, thick transparent crystals, having a melting point of 18°C. The yield was almost 100%. This material was the monomer of the methacrylic acid ester of tributyltin oxide, the structural formula of which is shown in Fig. 1.

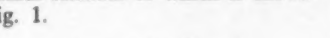

Fig. 1

Dibutyltin Dimethacrylate (DBTDM). The synthesis of this monomer was accomplished practically by the same method as the tributyltin methacrylate except that dibutyltin oxide, instead of tributyltin oxide, was used to react with the methacrylic acid. To 100 grams of dibutyltin oxide in benzene was added 69.2 grams of methacrylic acid. The reaction period was four hours at 25°C. Most of the oxide had reacted after four hours. The very small amount of residual unreacted oxide (approximately 0.5 gram) was filtered off, and the reaction solution was allowed to stand for seven days. The reaction product separated after partial evaporation of the solvent as transparent crystals, which were then filtered off and dried. It has a melting point of 50.2°C. This product was the monomer of dibutyltin dimethacrylate, the structural formula of which is shown in Fig. 2.

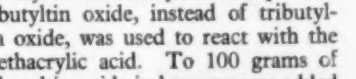

Fig. 2

Polymerization

Homopolymer of Tributyltin Methacrylate. The tributyltin methacrylate (TBTM) monomer was homopolymerized by emulsion method, according to the formulation based on parts by weight given in Table 1.

TABLE 1

Monomer (TBTM)	100.0
Water	180.0
Tergitol NPX (nonionic)	5.0
Lauryl mercaptan	0.5
Potassium persulphate	0.3

The monomer was added slowly to the catalyst emulsion mixture in a reaction vessel equipped with stirrer. The polymerization reaction continued for nine hours at 50°C. with constant stirring. The resulting latex was removed from the reaction vessel and coagulated by addition of methanol. The coagulated polymeric material was washed thoroughly with distilled water and dried for 48 hours at 50°C. under vacuum. The dried polymer is a tough rubbery material. Polymerization reaction is shown schematically in Fig. 3.

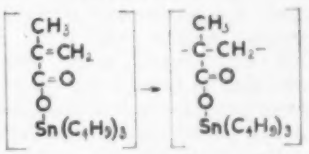

Fig. 3

Copolymer of Tributyltin Methacrylate (TBTM) and Dibutyltin Dimethacrylate (DBTDM). The two monomers were copolymerized by the emulsion procedure in a 98:2 mole ratio according to the formulation based on parts by weight given in Table 2.

TABLE 2

TBTM monomer	135.0
DBTDM monomer	3.2
Water	200.0
Triton X-100	17.0
Sodium bisulphate	1.8
Potassium persulphate	1.8

The monomers were added to the catalyst emulsion mixture in a flask equipped with stirrer. The polymerization reaction lasted four hours at 25°C. with constant stirring. The resulting latex was coagulated by the addition of methanol. The solid polymeric material was rinsed well with distilled water and dried under vacuum at 40°C. for 48 hours. The dried polymer is a clear, very elastic material. The possible polymerization reaction is schematically shown in Fig. 4.

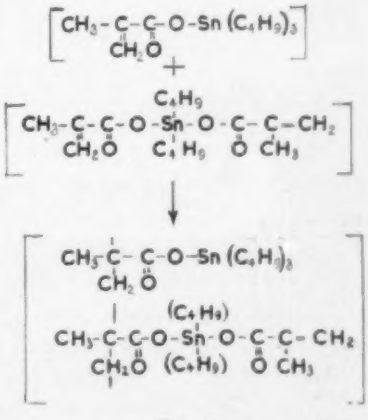

Fig. 4

Compounding and Vulcanization

These elastomers are new types of rubbers which have not been pre-

viously compounded and vulcanized. The tensile strength and ultimate elongation of the raw gum, uncompounded and unvulcanized, are approximately 125 psi and 400%, respectively. New compounding and vulcanization techniques peculiar to these rubbers have to be developed if they are to be of any practical use.

Various known curing systems have been tried unsuccessfully. These rubbers did not respond to the conventional sulphur cure using zinc oxide and stearic acid, metallic oxides such as litharge and magnesia, organic peroxides such as benzoyl and dicumyl, phenols and phenolic resins, and the carbamates and amines. It was found, for example, that zinc oxide used with sulphur tended to decompose the tin ester structure of the polymer instead of forming a polymer network or cross-link. From the results obtained, it seemed that the use of dibutyltin oxide instead of zinc oxide with the sulphur cure masked or protected the tin ester structure, and the sulphur appeared to be able to function as a cross-linking agent. The dihydride seemed necessary particularly in the copolymer in which active hydrogen is needed, theoretically, for cross-linking.

What actually happened chemically or what reactions were involved in the vulcanization of these tin elastomers is a matter of conjecture and would need further investigation. Nevertheless, a certain degree of success in their vulcanization has been achieved. The new compounding and vulcanization methods used for each elastomer are described. The compounding formulations (based on parts by weight) which were developed for each particular elastomer are shown in Table 3.

TABLE 3 COMPOUNDING FORMULATIONS

Homopolymer of Tributyltin Methacrylate (TBTM)

Polymer	100.0
Dibutyltin oxide	10.0
Dibutyltin dihydride	2.5
Sulphur	3.0

Optimum cure, 45 min. at 250°C.

Copolymer of TBTM/DBTDM (98 : 2 mole ratio)

Polymer	100.0
Dibutyltin oxide	10.0
Stannous chloride	1.5
Dibutyltin dihydride	2.5
Sulphur	3.0

Optimum cure, 30 min. at 290°F.

Properties of Vulcanized Elastomers

Range of cures to determine the optimum vulcanization time and temperature were run on the two compounds based on the preceding formulations. The properties obtained on the optimium cure are tabulated in Table 4.

TABLE 4 PROPERTIES OF VULCANIZED ELASTOMERS

Properties	*Homopolymer (TBTM)*	*Copolymer TBTM/DBTDM, 98:2 Mole Ratio*
Tensile strength, p.s.i.	400	300
Ultimate elongation, %	370	250
Gehman values, °C.*		
*T*2	24.0	21.5
*T*5	20.5	13.5
*T*10	12.5	3.5
*T*100	below −65.0	−44.0
Volume change, %**	125.0	32.4
Optimum cure	45 min. at 250°F.	30 min. at 290°F.

**T*2 Temperature at which the rubber becomes twice as stiff as at 25°C.

***Change in volume after immersion in iso-octane for 24 hours at 25°C.

Summary

The synthesis of alkyltin methacrylate monomers and their polymerization into rubbery materials has been accomplished. Compounding and vulcanization techniques have been developed for the homopolymer of tributyltin methacrylate and for the copolymer of tributyltin methacrylate and dibutyltin dimethacrylate. The properties of the vulcanized elastomers have been determined. The tensile strength of the vulcanized material increased approximately threefold over the unvulcanized compound even without the use of reinforcing fillers. Work, both in the synthesis of organotin elastomers and in improved vulcanization techniques, is continuing.

Increasing Use of Polythenes in Rubber Processing

APPLICATION of low-molecular-weight polythenes is fast expanding in the field of rubber compounding, according to Allied Chemical International. The company states its A-C Polythenes are now being used commercially in the processing of natural and synthetic elastomers.

According to Allied Chemical, these polythenes represent a new class of rubber compounding ingredient that is currently used for improving processibility, and for conferring vulcanizate properties suitable for many types of rubber products. This is said to be due, in part, to their outstanding tack-modifying and lubricating behaviour, and to their relatively high compatibility since the incorporation of as many as 10 parts to 100 parts of the different elastomers shows no evidence of blooming or migrating.

For general compounding purposes, from two to five parts are usually sufficient to provide a marked improvement in processing properties. Tack can be modified without adverse effects on adhesion of laminated and fabricated products. Easy release from mill, Banbury or calender at elevated temperatures is achieved; in addition, better mould flow and release properties are obtained.

Viscosities, scorch-sensitivity and shrinkage are decreased, dimensional stability improved, and calendering and extruding rates increased. And because of the excellent lubricating action of the polythenes, mixing cycles are said to be shortened, resulting in higher production rates and lower power consumption.

Quoted as a case in point is the experience of Hatfield Wire and Cable, Division of Continental Copper and Steel Industries of Hillside, New Jersey, whose manufactures include neoprene jacketed lighting and power cables. The company reported that some of its neoprene batches stuck to milling rolls and delays were experienced in getting neoprene slabs to cooling chambers due to sticking which led to later scorching. Adding the polythene in the mixer completely eliminated sticking and eased release.

The sole distributor for Allied Chemical International in the UK is Kingsley and Keith (Chemicals) Ltd., 38 King William Street, London, E.C.4, from whom information and supplies are available.

UMP Newcomer

Universal Metal Products Ltd., of Salford, Lancs, are now supplying decorated oval tubes made from polythene.

These tubes, sold under the trade name 'Umpoval' have, in common with all UMP plastics tubes (UMPEX tubes) a buttress thread, and are fitted with a similarly threaded cap in order to eliminate overriding of the cap.

Protective lacquers have been evolved for both Umpex and Umpoval tubes, and are being supplied as required, to suit a wide range of products.

Boxmakers Ltd., of Manchester, have produced for Meccano a new liner vacuum formed from Iridon high impact polystyrene sheeting.

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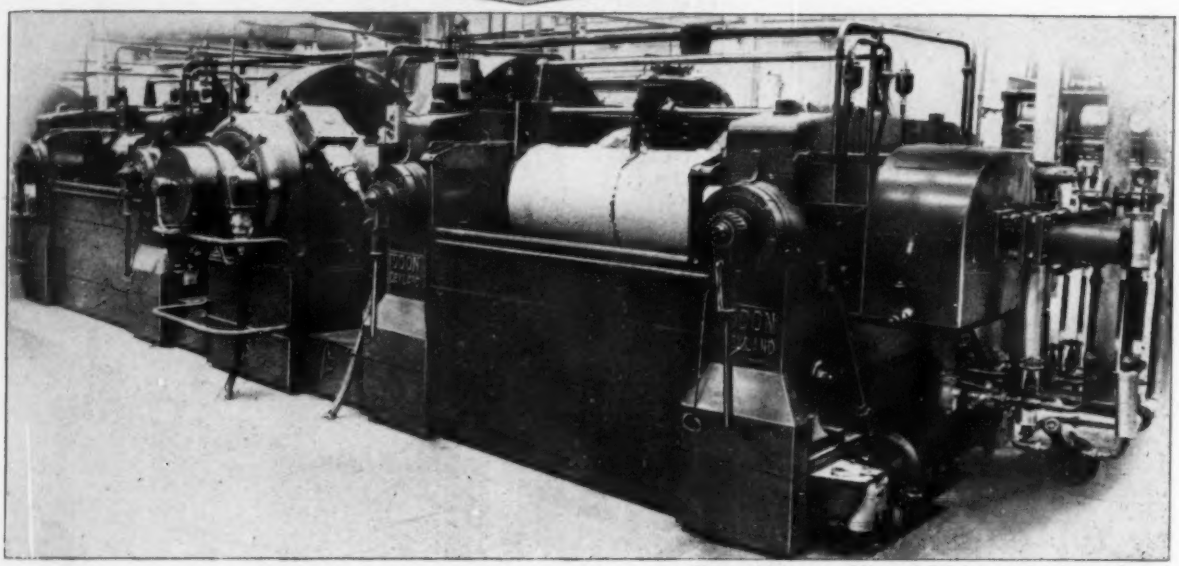

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Macromolecules in Moscow

WIDE COVERAGE BY USSR INTERNATIONAL SYMPOSIUM

A CROWDED programme was organized for the 1,200 scientists attending the International Symposium on Macromolecular Chemistry, which was held in Moscow from June 4-18. The international character of the symposium was emphasized by the many visitors from outside Russia. Sixty-five of these came from the UK, about 85 from the USA, 12 from Belgium, two from Australia, 13 from Holland, five from Israel, two from India, five from Canada, 20 from Italy, one from Malaya, two from Turkey, 55 from France, five from Switzerland, five from Sweden and five from Japan. There were also no fewer than 68 from Hungary, 50 from East Germany, 40 from West Germany, 12 from Poland, 83 from Czechoslovakia, two each from Korea and Austria and one each from Yugoslavia and Bulgaria.

All the Symposium lectures were held in the University of Moscow

The visitors were housed in the Hotel Ukraina, one of the many modern Moscow skyscrapers, situated on the banks of the river in the south-west of the city in a new and rapidly developing section. In addition to the technical programme, a number of visits were arranged, including a trip round the city, visits to the Exhibition of National Economy, to several art galleries and to the Kremlin and its museum.

Simultaneous Translations

The lectures were held in the university, a colossal building situated on high ground to the south of the city where there are about 25,000 students. Two plenary sessions were held in the large hall. Those attending were supplied with small battery operated wireless sets on which the lecture could be heard either in the speaker's original language or on a simultaneous translation into one of the two other official languages of the conference (the three official languages were Russian, English and French).

The visitors were first welcomed by Professor V. A. Kargin, the well-known Russian polymer chemist, then by representatives from the Government and the university. Professor H. Mark, of Brooklyn, USA, then gave his address on 'Progress in Polymer Research.'

These proceedings occupied the whole of the morning of June 14. In the afternoon the conference split into three or more sections, each dealing with one aspect of polymer chemistry and physics. Three and sometimes four sessions were held simultaneously so that it was impossible for anyone attending to hear more than a small fraction of the papers which were read. Some idea of the scope of the conference and of the international coverage can be gathered from a glance at the titles of some of the papers.

These included: 'Synthesis and polymerization of esterified polyacrylates' (Russia); 'The structure of hardened unsaturated polyesters' (Czechoslovakia); 'Crystalline polyvinylcyclopropane, polyvinylcyclopentane and polyvinylcyclohexane' (USA); 'An exact evalution of the non-steady state in free-radical polymerization' (Belgium); 'Catalysts for vinyl polymerization from rare metal halide complexes' (UK); 'The polymerization of formaldehyde initiated by ionizing radiation' (France); 'The influence of the structure of organic amines on some properties of ion - exchange polystyrene resins' (Poland); 'Degradation and cross-linking of polyisoprene in *Hevea brasiliensis* latex during processing and storage' (Malaya); 'Reactions of polymerization and degradation by gamma-rays' (Italy).

Proceedings were generally well conducted but in view of the very crowded nature of the programme, there was little time for questions. These were submitted in writing and answered from the rostrum by the lecturers, generally in groups. In some cases the lecturer spoke so rapidly that it was virtually impossible either to take notes or to follow the translation. However, all the papers were printed in full in the original language of the author together with an abstract in the two other official languages.

Besides the formal meetings, there were many valuable informal contacts between those attending the conference and some were able to visit one or more of the Russian institutes specializing in particular branches of polymer science or rubber research. It is hoped to include an account of some of these in future issues of *RJIP*.

Toys Impounded

Thousands of imported plastics toys found to contain soil or prohibited seeds have been impounded in Australia. The importers have been informed that the toys must be destroyed or returned to the exporting country.

The toys impounded included inflatable types containing soil ballast to keep them upright and other toys in which seeds had been placed to cause them to rattle. The Minister for Health pointed out that, under the quarantine regulations, soil was a prohibited import and the importation of seeds was also strictly controlled or prohibited.

Storage Solution

A new storage system is being used by KC plastics of Stockport for polythene rolls. Made of Dexion slotted angle, it consists of a series of spars jutting out from a wall. The rolls, fitted with heavy board cores, slip neatly on to the spars.

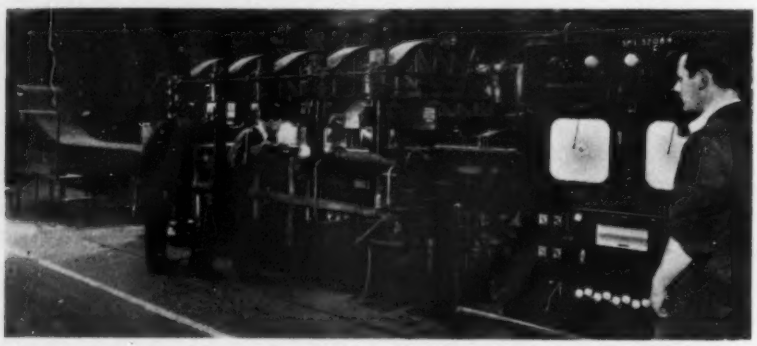
The system is being used in the bag making shop, and does away with the previous complication of sorting which involved the constant turning over of rolls weighing up to 80lb. each.

The Empire Hall, Olympia, will be the background for the 2nd international compressed air and hydraulics exhibition and fluid power conference, which will be held from April 30-May 4 1962.

Dunlop Belting

NEW INDUSTRIAL LABORATORIES

THE recent completion of new laboratories at the Speke, Liverpool factory of the Belting Division of the Dunlop Rubber Company, has enabled the division to operate a new system to cope with the development of all types of belting. The laboratories are fully equipped to carry out every process in the manufacture of a belt, from the weaving of the fabric to the evaluation of the completed article. The testing section is engaged on control tests on current production, and samples are cut from every separate belt manufactured and the results, after evaluation, are passed on for the release of the belt to the sales organization, so that corrective action can be taken immediately on the production line if necessary.



Manufacture of an experimental belt on an automatically controlled pilot-plant press in the factory, under close technical supervision

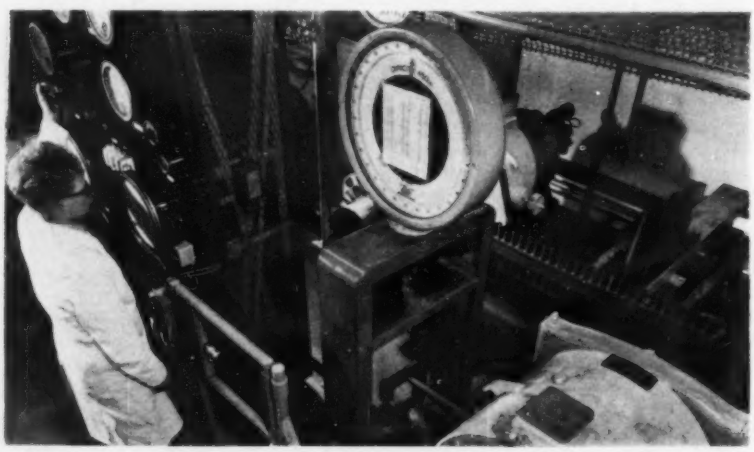
New Flame-resistant Belt

The tests are very comprehensive and include tensile strength and elongation, impact resistance, adhesion resistance, tear resistance, flame resistance and non-static properties. The majority of these are carried out to specifications of the National Coal Board. One of the latest additions to the range of beltings available is a flame-resistant transmission belt which is the first of its kind to be given NCB approval. Development of this belt has been done very rapidly following pit fires in Scotland which resulted from the use of non flame-proof transmission belting.

Another new belt is one with a fluted edge produced under licence from Numec Ltd., who hold rights on a French patent. This is expected to have a capacity approximately 50% greater than a conventional belt of the same width, without the flex and fatigue cracking normally associated with edged belts.

Development

The development section of the new laboratory is entirely self-contained, but has the advantage that it can draw upon the results of work carried out at the Dunlop Research Centre at Birmingham. This ensures that any new developments in technique or knowledge can be incorporated with the minimum delay, to improve the performance and economy of all types of belting. In addition to having access to all the equipment used for control testing, it possesses a range of highly-specialized equipment enabling the production significance of any new idea to be evaluated. Among this equipment a modern 12in. laboratory mixing mill is noteworthy. It is equipped with the latest safety device designed by the Research Association of British Rubber Manufacturers, which, in conjunction with Dunlop disc brakes, affords maximum protection. A hand loom is used for the preparation of experimental weaves or the evaluation of new fibres in woven form, and a spreader and calender also form part of the processing machinery in use.



Setting up the conditions in the Dynamometer Laboratory for an endurance test on a fluted edge belt

Service Test

One of the major items on the development side of the laboratory is the dynamometer. This is a 25hp machine which enables service conditions to be simulated and is used to carry out endurance tests, to measure coefficients of friction, power transmission and driving characteristics of transmission and conveyor belting. Consideration is being given to the construction of a much larger 800hp. machine.

After Sales Responsibility

The new laboratories have enabled the division to extend their technical service facilities to customers and any special problems will be solved by the qualified development staff. Another aid to belting users is a film which has been made, with the co-operation of the National Coal Board, to demonstrate the correct methods of installing and maintaining conveyor belting to obtain the best possible performance. This 29-minute film, called 'The Care and Maintenance of Conveyor Belting,' is available in 16mm. black and white with sound, and is distributed free of charge through the Dunlop Film Library, Wilton Crescent, S.W.19.

Mr L. P. Simpson, works manager of Baker Perkins, has been appointed a director.

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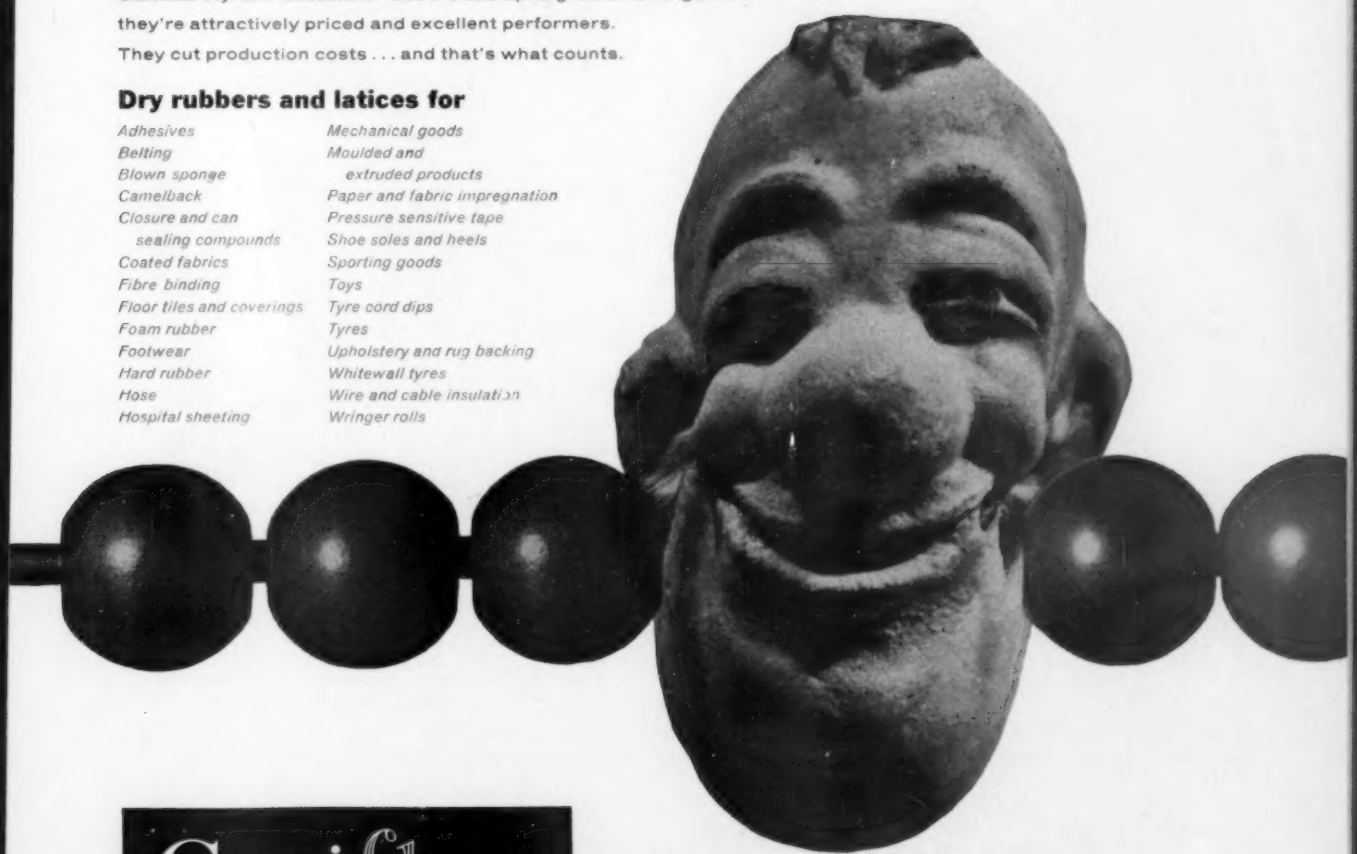

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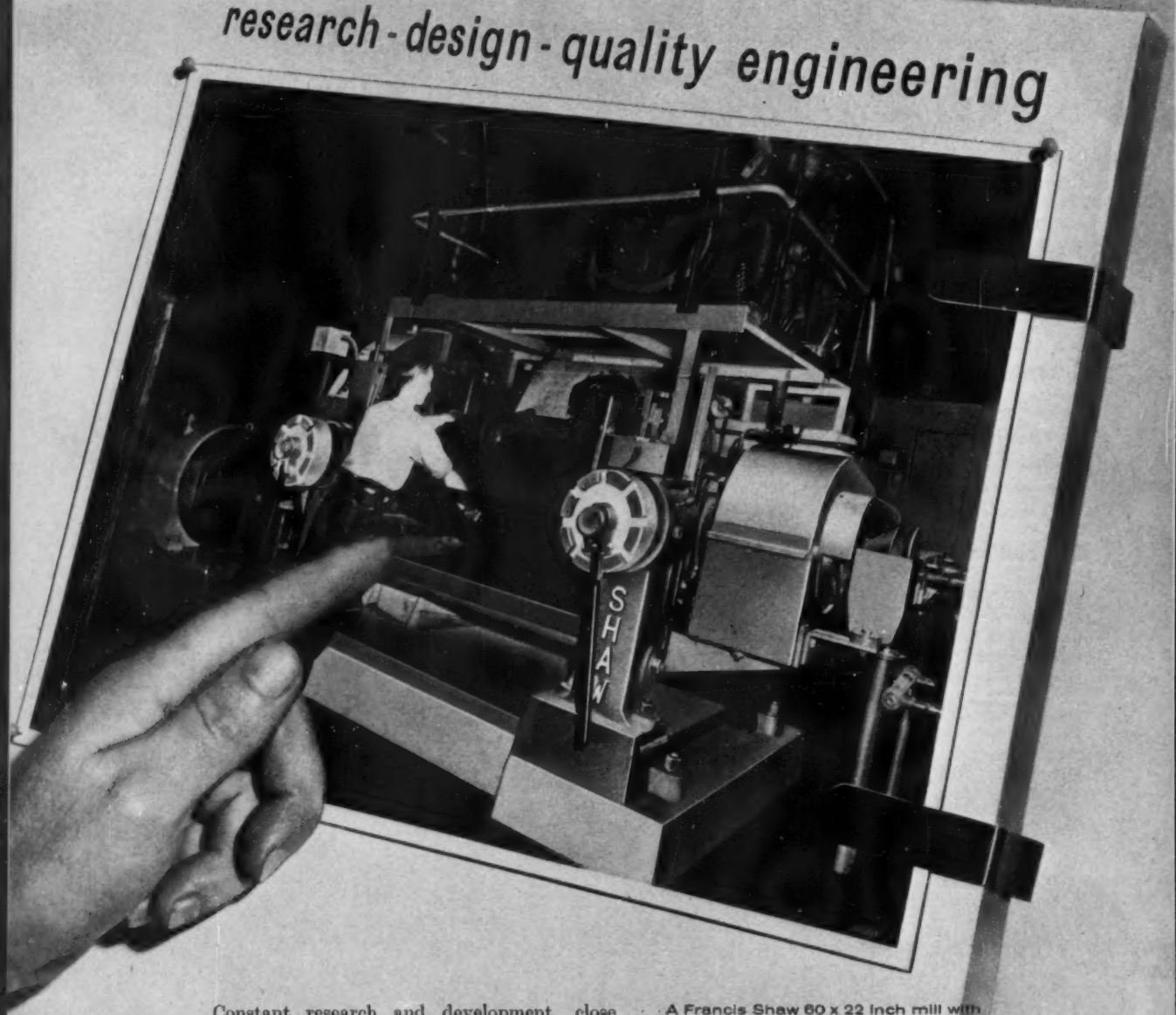

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OVERSEAS AGENTS THROUGHOUT THE WORLD

P4452

Tyre Industry Investigated

NEWS FROM SOUTH AFRICA

THE Board of Trade and Industries has decided that monopolistic practices in South Africa's £18m. tyre industry have greater advantages for the public than disadvantages. The board expressed this opinion in a report tabled in the House of Assembly on its extensive investigations into the tyre manufacturing and distributing industry in terms of the Regulation of Monopolistic Conditions Act. The report did not recommend that any steps should be taken in the present circumstances to terminate monopolistic conditions in the industry.

There were four tyre factories in the Union producing the products sold by seven companies, the report indicated. With one exception the companies were subsidiaries or associates of oversea firms in Britain and the United States. In 1957 capital investment in the tyre manufacturing industry totalled £18,311,000. The value of all products sold amounted to about £27m.—of which tyres accounted for £22m.

Before 1935 tyres and tubes were imported from abroad. In 1957 imported tyres represented only 1.8% of the turnover of new tyres. All seven companies producing tyres were members of the South African Tyre Manufacturers' Conference (the TMC), which acted mainly as a price cartel, laying down uniform conditions of sale throughout the Union, South West Africa and the Rhodesias, and determining prices and discounts to be quoted to buyers, including the Government, railways, car assemblers and retailers.

The TMC deliberately tried to exclude all forms of price competition among its members. It similarly tried to eliminate competition among retailers by a comprehensive system of collective resale price maintenance. A memorandum from the TMC said the association came into being to remedy chaotic conditions in the industry.

The report contained arguments for and against monopolistic conditions being in the public interest and concluded that, on balance, the monopolistic practices of the TMC were justified.

Geodetic Springboks

Six models of buck were made in glass fibre in Cape Town to be displayed above the Cape Pavilion at the Union Festival Exhibition in Johannesburg. Three of the South African Railways' largest-type trucks were used to carry the springboks the 1,000 miles to Johannesburg. The models, which are 40ft. long, 2ft. wide and 4ft. deep, were built in the grounds of the University of Cape Town. Each buck weighs about 375lb.

They were constructed on the geodetic architectural formula, which was perfected by the American engineer and mathematician, Mr Buckminster-Fuller. In this system direct stresses and pressures are distributed to eliminate any acute pressure and stress on any particular part.

The original mould for the springbok was designed and sculptured by Mr Hugh Floyd, of Cape Town, who introduced the architectural geodetic principle to South Africa. The six springboks, now suspended in a pattern 80ft. high on the Cape Pavilion, were moulded in only six weeks under the supervision of a Cape Town bonded glass fibre constructor.

Mr H. L. Hyde has been appointed a director of the Goodyear Tyre and Rubber Co. (GB). He replaces Mr P. E. H. Leroy who has resigned from the board. Mr J. L. Mumby has been appointed secretary.

Question Corner—124

(Second Series)

449. What are the methods that may be used to stabilize rosin against oxidation?

(Answer next week)

Answer to Question Corner—123

448. Shrinkage of injection moulded polythene parts is generally completed within one day after ejection. In certain applications it must be reduced as much as possible, especially for parts that are subsequently to be used as components for another assembly. In addition, uneven shrinkage may cause warping of moulded items.

The moulder can prevent excessive shrinkage by controlling the operating conditions, designing the moulded part and the mould with this in mind, and choosing the most suitable resin.

Shrinkage may also be reduced by moulding at lower temperatures, that is by reducing the barrel temperature and running a cold mould. It can also be reduced by packing the mould more tightly by the use of a moderate barrel temperature and a very high ram pressure, or a fairly high barrel temperature and moderate ram pressure. It should be remembered, however, that excessive temperature or pressure may result in too much flashing.

Another method that has been suggested is to use a high ram pressure and extended injection time. This allows additional resin to flow into the mould as the material in it cools and shrinks. Longer dwell time is particularly useful whenever an inside dimension is critical. As the moulded part coils and contracts round the core, this will maintain the inside dimension of the part.

Shrinkage is affected by the basic molecular properties of the resin. Polythenes of lower density are less susceptible to shrinkage as well as those of higher melt index, which permits lower moulding temperatures.

(Another question next week)

Polly Ester Says . . .

'Crumb — what falls from the rich rubber manufacturer's table'

MEN *and* MATTERS

A Review of People and Events

THE news that Dr N. A. de Bruyne has resigned from his position as managing director of CIBA (ARL) Ltd., will come as a surprise to most of us. He has taken this step, I understand, because he wishes to devote more time to research, especially to the development of scientific instruments. He leaves the company at the end of this year, but will remain on the Board.

Dr de Bruyne, who founded the company, was educated at Lancing College and Cambridge University. After obtaining his pilot's licence in 1929 his interest turned increasingly towards problems of aircraft structures, and he built and flew several machines.

In 1934 Dr de Bruyne built at Duxford a laboratory and aeroplane hangar with its own landing ground. This undertaking he financed from his own resources and established it under the name Aero Research Ltd. Control of this company was acquired by CIBA Ltd., Basle, in 1947, Dr de Bruyne remaining as managing director. The name was changed to CIBA (ARL) Ltd. in 1958.

Joint MDs

Dr de Bruyne will be succeeded by R. F. G. Lea and D. A. Hubbard, who will be joint managing directors. Mr Lea, who joined Aero Research in 1937, will also become deputy chairman at the end of the year. Mr Hubbard was mainly responsible for the planning of the new urea-formaldehyde and expoxy-resin plants at Duxford.

Californian Budget

There is no lack of colour in the Wrighton exhibition of 'Californian' kitchens, which is now on display at the Regent Street showroom of Formica Ltd. Five new kitchen designs are on show: enough to make any woman's mouth water. Each kitchen has an individual colour design in Formica decorative laminates. One is in blue and white; another uses Suntone yellow and Charcoal Capri Formica and has a built-in refrigerator.

The kitchens are certainly bright and cheerful: but you certainly pay for the Californian sunshine. The brochure issued says 'planned with your budget in mind.' But the cost of one small wall unit (about 24 x 20 x 12in.) is £8, and other units are priced on a similar scale. I wonder whose budget they have in mind? Certainly not mine.

by Peter Richards

News from the Bulletin

There comes this week a copy of 'John Bulletin,' the house organ of the John Bull Rubber Co. Ltd., and more than ordinarily interesting it is.

One item announces the retirement at the end of May of Mr Trevor T. Laker, for many years responsible for the sales of tyres and allied products. Mr Laker is 70, but as all his friends will agree, certainly does not look it. An East Anglican, born in Ipswich and educated at Sudbury Grammar School, he has had a career more varied perhaps than any other man connected with rubber in his own time. It began in a bank, and then there was a period of deep sea trawling, a stint as a circus hand, and an apprenticeship as a student farmer.

Moving to Coventry, when the family of his wife-to-be settled there, he became an insurance agent in that city, from which job he moved to the Calthorpe Motor Company of Birmingham as an apprentice. Even then his future commercial life was not determined, for he joined a firm manufacturing precision engines where part of his duties was to test motor cycles and he became one of the early Senior T.T. riders. He was a despatch rider in the early part of the first World War, then transferred to the RFC, becoming a pilot and serving in Egypt until demobilization in 1919. Afterwards he became in turn the owner of his own civilian flying company, spent some years in important capacities in motoring journalism, and in March 1933 was persuaded to join John Bull Rubber Co. Ltd. as advertising manager.

On the Board

Approximately 18 months later he became general sales manager and, in 1946, joined the board as sales director, the appointment he still held until his retirement.

He has been responsible for the sales policy of the company over the years and has, by hard work and much personal charm, earned nationwide respect for John Bull. He has innumerable friends and acquaintances both inside and outside the trade, as well as in the John Bull organization.

We wish him long years of happiness in his retirement. Everybody who has known him in one capacity or another during the past 30 or 40 years will certainly join us in this.

Gentle Publicity

It was indicated before the Press showing of Dunlop's latest film, called 'Comfort in the Air,' that the production was an example of the 'not-so-obvious' tendency in sales films. This school of thought believes in entertaining the consumer, and slipping in the brand name quietly—almost apologetically in some cases.

The device used in this film, which will be screened in 250 special programmes to housewives in the London

A Warlingham shop manager made this new car for 15s. He panelled his Austin Countryman with four yards of Fablon in a grained-wood pattern, finishing it off with clear varnish

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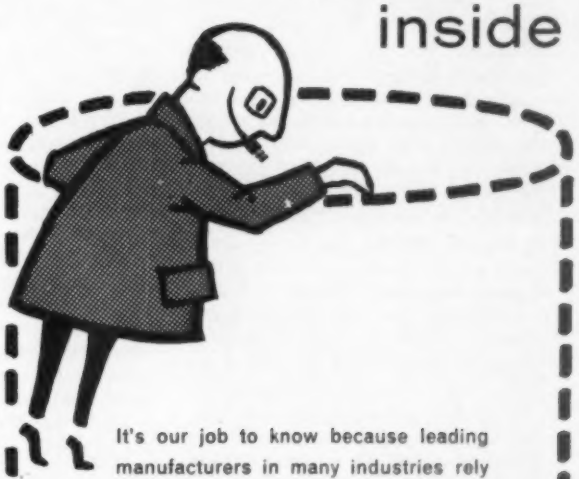

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area this winter, is to allow a typical professor—who knows everything about biology and nothing about life—to discover a Dunlopillo mattress and think it is a new botanical mutation. Through the excited questions he asks himself and puts to a willing salesman, we learn all the various virtues of Dunlopillo.

The device doesn't quite come off. The oblique approach demands that the story is sold and not the product, which is carefully wrapped round by the story. In this film it becomes too obvious that the story is just an excuse to sell the product.

Laporte Directors Change

Following the 53rd meeting Mr J. Jones retired from his position as executive chairman of Laporte Acids Ltd., The Sheffield Chemical Co. Ltd., James Wilkinson and Son Ltd., and Glebe Mines Ltd., but will continue to serve as a non-executive director of the parent company. His place is taken by Mr C. B. Holland who has relinquished his directorship of Laporte Chemicals Ltd.

Plastic Houses

We have our housing problems in Britain, but apparently they are the merest chicken feed compared with the situation in Japan. There, largely as a consequence of war damage and what-not, it is about as bad as, if not worse than, the position in Russia. But the Japanese are adaptable folk and according to a Tokio message which I have just been reading, a small prefabricated plastic house which its manufacturers claim can be assembled overnight, has now been evolved there. It is, so the message says, a house of the midget type, which will soon be on sale in bulk at a price not easy to meet the pocket of the average Japanese family, but before very long, the fabricators say it can be made available at about £350 sterling, which is something quite beyond anything we can do here.

A brief description says that the materials are at least 60% plastic, these being fitted into a light steel frame by bolts to a concrete foundation. What is much more important to the Japanese, and to the other people of the Far and Near East, although less our concern in the Occident, is that these plastic houses have high resistance to earthquakes and typhoons. The £350 price is, I gather, the minimum. You could have something approaching a medieval manor for twice the cost, and a veritable palace for £1,500, or the yen equivalent.

Punic Plastics

We may be seeing Punic plastics soon. The Aids to Industries Board Malta has published a booklet called 'Malta Means Business,' dealing with the advantages of setting up a business on the island. I understand that already two plastics organizations and a rubber firm are interested.

Malta has been described as the halfway house between the Orient and the Occident. The Phoenicians, followed by the Carthaginians, held the island for centuries as a link in their trading empire, and gave the people the Punic dialect they still speak.

Malta offers four advantages to industrialists looking for a new field of development. It has a good harbour in a strategic position at the crossroads of the Mediterranean. Within easy reach are unexploited markets in North Africa and the Middle East. There is a ready supply of labour, at half the UK cost. A £32½m. development plan includes a new structure of grants and loans to manufacturers of up to 33⅓% (50 in some special cases) of the cost of fixed capital assets.

And there is, of course, an off-duty advantage. The sun shines from January to December.

Beware the Bandicoot

The planter in the Far East has had a rough time at the hands of novelists. There is hardly one fictitious planter who has not gone native; who is not sinking deeper and deeper into the jungle, weighed down with pink gin and planters' punch. The ordinary novel reader would find it something of a shock if he read an article which appears in the latest issue of the quarterly journal of the Rubber Research Institute of Ceylon.

This shows that, far from having the time generously doled out to him by novelists in which to achieve dissipation, the planter has many enemies to contend with if he is to produce rubber. These include elephants, deer, pigs, cattle, monkeys, hares, porcupines, bandicoots, rats, squirrels, bats, flying foxes, snails, slugs, termites, mites, scale insects, mealy bugs, cockchafer grubs and borers, all of which can cause widespread havoc. Add to these diseases such as phytophthora palmivora, black stripe and canker, and one wonders if the planter even has time for a quick one.

Polythene Psychology

I heard the other day that polythene is giving more courage to US students. The polythene is in the form of a polo game set of four mallets, one ball and four dome-shaped goal markers. According to the manufacturer: '. . . physical education teachers are using the mallets in place of hard field hockey sticks. They have observed that, with the new-type mallets, their more timid students are encouraged to take an active part in competitive games.'

I have seen a lot of literature on the physical and chemical properties of polythene, but this is the first time I have read anything on the mental qualities it engenders — although stress-strain curves do hint at a study of the neuroses of materials. Here is a fresh, unbroken field—which would seem to cry out for the pen of Dr Wake, or of our old friend Hevea do Brazil.

Bethune Manager Appointed

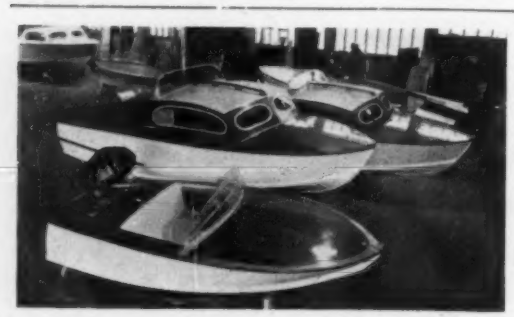
Anthony J. DiMaggio will be factory manager of Firestone's new tyre plant in Bethune, France. He leaves Firestone's plant in Pottstown, USA, where he held the post of production manager.

Construction of the company's Bethune tyre plant will be completed late this year. It is located 21 miles west of Lille, the big industrial and rail centre in northern France. The plant will produce a full line of tyres and tubes for passenger cars, trucks, buses, farm equipment, motorcycles and scooters.

Mr DiMaggio has been with Firestone since 1943.

* * *

Herman C. Nolen, president of McKesson and Robbins Inc., has been elected a director of the B. F. Goodrich Company.



Cobex rigid vinyl, made by BX Plastics, is being used for the windscreens of these motorboats, launches and cabin cruisers. Manufacturer is G. H. Burgess Ltd. of Southall

Plantation Commentary

ATTEMPTS TO SABOTAGE PROJECTED RUBBER EXCHANGE

by our Malayan Correspondent

FROM KUALA LUMPUR

THE Minister of Commerce and Industry, Inche Mohd. Khir Johari, has warned that the Government will take action on any attempt to 'sabotage' the scheme to set up a rubber exchange in Malaya. The Minister did not mention any country but in Malaya it has generally been taken that he was referring to Singapore. At present virtually all Malayan rubber is sold through Singapore.

The Minister was speaking at the inaugural meeting of the 21-man committee which will consider a detailed plan for establishing a rubber exchange in the Federation. Members of the Singapore rubber trade are on the committee which will draw up legislation to put the scheme into effect.

The Minister said that the Malayan Government had heard rumours that a certain section of the rubber trade outside Malaya was strongly opposed to the idea of a rubber exchange. 'It has, in fact, made attempts to sabotage it by threats and by intimidation of those members of the trade who are working in furtherance of this scheme,' he said. 'I hope these rumours are not true for if they are true it would be extremely easy for the Government to deal appropriately with this section of the trade and, in fact, to ensure that all the rubber produced in this country is handled as regards the trading side within the country.

'It is not our intention to disrupt the old-established channels of trade but no one should be left in any doubt that any deliberate obstruction to our aims in this respect would be met by whatever means is necessary to enable us to achieve our objects.'

The rubber exchange, said Inche Mohd. Khir, would operate under a set of rules which would provide security necessary to promote and build up international confidence in the Federation's rubber industry. The bulk of the 700,000 tons of rubber produced in Malaya was marketed outside the country.

As an independent nation and the world's largest producer of natural rubber, the time had now come for the Federation to set up a commodities exchange organized on sound lines and accepted in international trading circles. Confidence in the economic and political stability of the country was now so well established that the Government considered it essential that it should have its own rubber and perhaps later on other commodity exchanges.

'I wish to make it absolutely clear,' the Minister went on, 'that it is the Government's intention that the rubber exchange should be a well-organized market, free from any sort of Government control.'

Mr H. Kissin, deputy chairman of Lewis and Peat Ltd., who prepared a memorandum on a rubber exchange in his personal capacity for the Prime Minister, said in Singapore that the setting up of a market in Kuala Lumpur was logical and necessary. He had not advocated in his memorandum the closing down of Singapore as a centre of the rubber industry although he had expressed anxiety over a number of serious shortcomings so far as the present operation of the rubber market in Singapore was concerned.

Singapore as the main shipping and entrepôt centre of South East Asia would continue to play an important part in the future of the rubber industry and he hoped that Singapore would be prepared to co-operate with the Federation of Malaya in the establishment and operation of a market in Kuala Lumpur. He did not think Singapore's economy would suffer as a result but it would stabilize trade in both centres.

Never-Ending Process

Questionnaires have been sent to member companies of the Rubber Growers' Association to find out how much is being re-invested by them in the Federation each year. It follows a suggestion by the United Kingdom High Commissioner in Malaya, who hopes to make an overall review of the British contribution to the Malayan economy.

The association's annual report refers to requests that have been made to the Rubber Producers' Council to ask the Malayan Government to renew the replanting scheme which is due to end on June 30 1962. The scheme provides financial grants for carrying out replanting and the Government has not yet given any indication that it will be renewed.

The report states that replanting must be a continuous and never-ending process.

This was particularly so since payments by the Government under the scheme had so far been financed out of the increase in export duty which coincided with the introduction of the scheme.

Advice Wanted

The Rubber Research Institute of Malaya hopes to have 150 rubber instructors in the field in its smallholders' advisory service by the end of this year, rising to 200 by the end of next year and 300 by the end of 1963.

There is an increasing demand for advice from smallholders and the expansion programme has been advanced to meet it. At the end of last year there were 90 rubber instructors. Forty are to be recruited for training this year and will attend a three-month course where they will be taught the theory and practical work of growing and processing rubber in smallholdings. Malays and Chinese with Cambridge Overseas Certificates are being recruited.

Typical of the need that is developing is the announcement by the Perak State Government of $2m. advanced to the newly-formed State Development Board to plant 11,400 acres of rubber. The Land Development Board is the State's contribution to the general Malayan programme of rural development and the board hopes that this year it will be able to prepare about 7,500 acres of land for planting with rubber by smallholders.

The board will clear the land, terrace it, plant cover crops, apply manure and erect fencing. The State Government's grant will allow an immediate start to be made.

Assurance Unwanted

Malayan planters, according to reports, are concerned by a decision of estate agency houses to replace the long-established Malayan Planters Provident Fund with an insurance scheme, which has been implemented and backdated to January 1. About 300 members of the Incorporated Society of Planters are affected. A major difference is that the provident fund stipulated that after 10 years' service a planter could receive both his own and his employers' contribution if he left the fund. Between five and 10 years the planter got a proportion of his employer's contribution. The insurance scheme does not permit planters to realize their full financial benefits until they reach the retirement age of 55.

It is understood that further representations are being made to agency houses by the ISP.

Fragmentation Problems

For the first time a co-operative society has been formed in Malaya to purchase rubber estates to save them from fragmentation, the process that frequently happens when a British-owned or other estate is purchased for a handsome price and then is carved up into smaller lots for sale at a profit to smallholders.

Sponsor of the society is the Minister for Works, Posts and Telecommunications, Dato V. T. Sambanthan, who has been worried for some time by the steady process of fragmentation which normally means that the Indian estate labour force lose their jobs.

He pointed out at a recent meeting of the Malayan Indian Congress, of which he is president, that the frag-

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mented estates were frequently purchased by Chinese who worked hard and saved. He suggested that the Indians save their money for the purpose by practising economy and by not drinking (Dato Sambanthen is a teetotaller and a leader of the prohibition group) so as to invest in co-operatives and purchase good estates that came on the market.

The new co-operative, the National Land Finance Co-operative Society Ltd., has a registered capital of £1.1m. and its shares will be available for estate workers and anyone else interested. The organization will encourage, promote and facilitate the operation of estate co-operatives and co-operative land development societies.

The co-operative is authorized to buy or acquire land on behalf of members for opening rubber, oil palm, coconut or other estates. It will be empowered to lend money to co-operative estate societies or co-operative land development societies.

Shares of $100 (£11 13s. 4d.) each will be issued and it will be possible for intending members to pay in ten monthly instalments.

Dato Sambanthan, announcing the formation of the Society, said that this was a 'positive move' against the further fragmentation of estates. All that was required was the wholehearted support of all estate workers and anyone interested in providing a stable livelihood for those working in the rubber industry. 'The society will consolidate the funds of the people and buy estates and run them without letting them be fragmented,' he said. 'Another purpose will be to buy up an estate at the request of the workers of that estate if the estate is in danger of being fragmented.'

He felt that the co-operative would be the answer to the social problem of fragmentation. Many estate workers had been forced to leave their homes because of it.

In Brief

More joint consultative committees are now being set up on rubber estates with the help of the Malayan Planting Industries Employers Association and the National Union of Plantation Workers. They deal with individual labour problems as they develop on estates though they are not concerned with the larger issues such as wages. The employers are keen on starting further committees. Of the 700 estates in Malaya, 340 now have joint consultation machinery.

Suggestions by planters that the toddy ration should be increased on estates are likely to be strongly opposed by the Malayan Indian Congress. At present only a limited amount of toddy may be sold and estate managers recently told the Minister of Labour that when the toddy ran out labourers bought more expensive drinks. The congress considers it an attempt to encourage drunkenness and has suggested that all attempts to improve living conditions would be nullified if more toddy is supplied to estates.

A plan for a thrift and loan fund whose money would be used for the purchase of estates is being considered by the National Union of Plantation Workers, which claims to represent all rubber estate workers, according to one of its officials, Mr John Emmanuel. If members subscribed a minimum of $1 a month (2s. 4d.) sufficient money would be released to invest in the purchase of rubber estates which would be run on model lines. Mr Emmanuel claimed that there had been an encouraging reaction to the scheme from union members.

Production Census

The report on the census of production for 1958 will include individual booklets dealing with 130 separate industries. Details of output, employment, wages and salaries and capital expenditure will be given.

Introductory notes to the census are now available from the Stationery Office, but figures for the rubber and plastics industries are not expected to be available for some months.

John C. Holmes has been appointed export manager of Glass Yarns and Deeside Fabrics Ltd., a member of the Microcell Group.

FREEZE LINING

For the first time one-piece polythene-lined cartons are being used for frozen foods. These were developed and are supplied by Metal Box, as part of their Diotite system, to Fropax Ltd., for packing fish fingers.

As the fish fingers are fried and packed warm, they need a container with a high degree of built-in grease resistance, and this is given by polythene, bonded to a duplex folding box-board dry waxed externally. The polythene also gives increased protection against drying out under refrigeration. A very efficient heat seal is said to be obtained, by using the lining itself as the thermoplastic adhesive, and this does away with the need for applying a special sealing material.

Thirty sales representatives from main distributors of Warerite products recently attended a special course of talks on decorative laminates. The aim was to ensure that representatives were fully aware of the nature of the products they were handling and their most satisfactory applications.

New Vinyl Floor Covering

LAUNCHED BY WILLIAMSON-SANDURA, LTD.

A 'UNIQUE supervinyl floor-covering' called Sandran is now available in the UK from Williamson-Sandura Ltd. of Lancaster. This is a new company formed by Jas. Williamson and Son Ltd. of Lancaster, and the Sandura Company of Jenkintown, Pennsylvania. It will market Sandran outside America, and ultimately manufacture the product in the UK.

During the last eight years rotovinyl floor-coverings have been rapidly developed in USA and the Sandura Company, who were among the pioneers in this field, now claim 70% of the market. Over 150,000,000 sq. yd. of Sandran are said to have been sold.

Sandran consists of three layers of material laminated together: a high vinycel on which the pattern is rotogravure printed, a top coating of high quality vinyl and a heavily saturated base.

Laboratory tests and actual use have proved that Sandran is resistant to most forms of household stains, even to concentrated caustic soda. The installation is similar to that used for laying linoleum. It can be cut with a knife, and joined by laying edge-to-edge.

There are 32 designs, some of which use gold or silver flecks. Trade advertising for the product commences in July and the consumer campaign will open in September.

Latex Stops Erosion

Synthetic rubber latex is finding a novel application in the USA landscaping trade as a means of preventing erosion of newly-seeded areas.

The new material, called Vulcanol, is said to have been used successfully at various test sites as a substitute for conventional hay or straw mulch. Alco Oil and Chemical Corporation, Philadelphia, Pa., is producing the material and Firestone is supplying the latex base.

Vulcanol is diluted with water and sprayed over bare soil. It forms a web-like coating which prevents erosion during germination of the seed. New grass easily forces its way through the porous material. The material decomposes after one to six months, depending on the formula used, and washes into the soil.

Rubber Statistics

WORLD POSITION AT THE END OF MARCH

THE preliminary information regarding the world rubber position at the end of March, which was recently published under this heading, can now be amplified. The following table (in 1,000 long tons), shows the natural rubber production position during the first quarter of the year and compares it with that for the first quarter of last year:

NATURAL PRODUCTION

	Jan.-March 1960	Jan.-March 1959
Malaya:		
Estates	99	94
Smallholders	75	69½
	174	163½
Indonesia:		
Estates	51	56
Smallholders	95	91
	146	147
Ceylon	25	18
Sarawak	12	8
Other British Borneo	6	6
Liberia	10½	10½
India	4	4
Vietnam	9	10
Cambodia	5½	5
Others	85½	93
	477½	465

In Malaya, where a progressive replanting policy is now beginning to bear fruit, output is increasing both on estates and on smallholdings. In Indonesia, on the other hand, production on estates is falling somewhat and this may well be due to the expropriation of the Dutch properties; on smallholdings, however, there has been an equivalent increase which balances the output for the quarter with that for 1959. Output in Sarawak and Ceylon have also been increasing during the period under review and once again replanting may be the reason for the improvement in the figures.

The following table shows the natural rubber consumption position during the first quarter of the year:

NATURAL CONSUMPTION

	Jan.-March 1960	Jan.-March 1959
UK	46	44
USA	139½	149
France	34	35
Western Germany	36	36
Remainder of Europe	100	110
Others	154½	143½
	510	517½

It is clear from the above table that the major manufacturing countries of the world, with the exception of the United Kingdom, are, to say the least, not increasing their consumption of the natural product. This is in sharp contrast with the position shown in the following table which reproduces the synthetic rubber consumption position for the first quarter of the year.

SYNTHETIC CONSUMPTION

	Jan.-March 1960	Jan.-March 1959
UK	27	18
USA	286	272
France	22	15
Western Germany	23	16
Remainder of Europe	27	22
Others	55	42
	440	385

It is particularly noticeable from this table that, in the UK, France and Western Germany, synthetic rubber consumption this year has increased by about 50% compared with last year. In each case, synthetic rubber accounts for about 40% of total new rubber consumed. In the USA, the corresponding percentage is approximately 67%, *i.e.*, about two tons of synthetic are consumed for every ton of natural.

Chemstrand to Expand

Chemstrand will expand their Coleraine, Northern Ireland, plant in the very near future. This was indicated by Mr O'Neil, president of the company.

Speaking in New York he said: 'The Coleraine plant was built for expansion—a possibility we are looking forward to in the not too distant future. We are more than pleased with progress to date.'

The plant, which produces acrylic fibre, already represents an investment of over £3.5m. It employs more than 400 on a 70-acre site.

Pye Bid

Pye, the radio, television and scientific instrument group, have made a bid for the £2m. Telephone Manufacturing Co., one of whose subsidiary activities is plastics moulding.

Companies in the News

Greengate and Irwell

The trading profit of the group, before depreciation and taxation, was £288,744 for the year ended March 31. In spite of the difficult year, Mr Jasper Frankenburg says in his report, £105,000 have been spent on extra facilities.

The latex thread factory at Melton Mowbray has completed its expansion, and the footwear division has made definite progress.

In Australia, the chairman reported, the company has become well established in the manufacture of Vee Ropes, and is about to manufacture conveyor belting.

Mr Frankenburg stressed that improvement in salesmanship in the industry, which had been at 'a depressingly low level,' could help to obtain better conditions.

Record Year for Laporte

Mr P. D. O'Brien, the chairman of Laporte Industries Ltd., in his statement in the 53rd annual report of the group, said that trading conditions at home and abroad had been generally favourable. The total profit of the group before taxation was a record at £3,147,900 and showed an increase of 73% over last year. The directors recommended an ordinary dividend of 7½% thus making a total dividend of 12% compared with 8% last year. Mr O'Brien said that he was satisfied that the companies' products were efficiently produced and that they could be sold in world markets in competition with other suppliers. He stressed the importance of research and of a sound personnel policy in the future of the company, and went on to deal with the various subsidiary companies of the group, all of whom had had a successful year with the exception of Pembina Mountain Clays Ltd., a Canadian subsidiary which incurred a loss. However, some improvement in trading conditions over the last six months had occurred, and it was hoped that this company would soon be working profitably. Mr O'Brien also referred to the other companies overseas and sales companies, and to changes in the board of directors.

London Rubber

Sales of the parent company for April and May this year show an improvement over last year, says the chairman, Mr Elkan M. Jackson, in his annual report.

Net profit of the group was £841,229 before taxation, and is a record. A final dividend of £20% less tax is declared, which brings the total distribution for the year to 30%.

Small losses were made by the new wholly owned subsidiary company in Germany (London Rubber Company GmbH), and by London Rubber Company (Nederland) N.V., which was formed recently to take over interests in Holland.

The chairman said that he expected improvements and profits soon.

An arrangement has been made to organize a 'high calibre' research team to develop oral contraceptives.

Peter Schidrowitz, managing director of Latex Processes and Dispersions Co. Ltd., Bury, Lancs., is flying to USA this month to attend a convention of rubber technologists, at which problems relating to backing compounds for carpets will be discussed.

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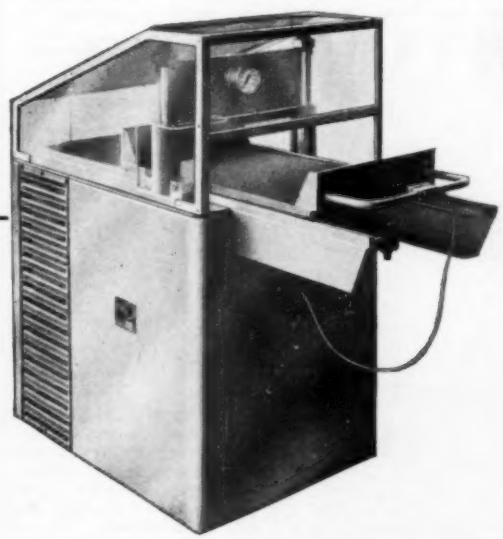

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PATENT SPECIFICATIONS

The following information is prepared from published Patent Specifications by permission of the Controller of H.M. Stationery Office. The full Specifications can be obtained from the Patent Office, 25 Southampton Buildings, W.C.2, at 3s. 6d. per copy (including postage).

Siloxane Elastomers

No. 832,488. Midland Silicones Ltd. Application and Filed, March 12 1957. Application in USA, June 27 1956. Published, April 13 1960.

Silicone rubbers resistant to oils are based on polymers or copolymers of fluorinated siloxanes of a specified general formula and a filler. In addition to resistance to oils, the silicone rubbers have a tensile strength of at least 500 psi, an elongation at break of at least 100% and excellent temperature stability. When the filler employed is an extremely finely divided silica, the tensile strength of the silicone rubbers is upwards of 1,000 psi and the elongation upwards of 500%. The silicone rubbers swell less than 20% when subjected to the action of hydrocarbon fuels such as iso-octane and toluene and less than 10% when subjected to diester oils and to lubricating oils.

Moulding Press

No. 832,712. British Industrial Plastics Ltd. Inventor: W. R. Groves. Application, April 26 1957. Filed, April 23 1958. Published, April 13 1960.

The invention relates to an improved drive mechanism for the feeding apparatus for a fully automatic plastic moulding press of the flat bed type. The feeding apparatus automatically moves the loading plate into and out of the press daylight at the appropriate moment in the cycle of operation of the press.

The improved drive mechanism comprises a freely pivoted pinion adapted to be moved, by power means, between racks, one of which is fixed with respect to the press and the other of which is movable and is attached to the loading plate, the arrangement being such that on movement of the pinion along the fixed rack, the movable rack is caused to be moved at twice the speed of the pinion and for twice the distance traversed by the centre of the pinion as it is moved along the fixed rack. By such an arrangement of drive mechanism, the power means for moving the pinion need only be capable of moving the pinion half the distance covered by the loading plate on its travel into and out of the press daylight.

Glass Flakes in Synthetic Resins

Nos. 832,963-4 Owens - Corning Fiberglas Corporation. Application and Filed, March 28 1956. Application in USA (No. 832,963), March 31 1955. Published, April 21 1960. No. 832,964 divided out of No. 832,963.

832,963.—Glass flakes are incorporated in transparent synthetic resins such as polystyrene, polythene, polyesters and polyamides. The glass flakes improve the properties of the resins including weathering, moisture resistance, distortion, dielectric strength, colour stability and resistance to thermal decomposition and corrosion. The mixing of the glass flakes with the resin should be carried out in some manner which subjects the flakes to as little mechanical damage as possible, *e.g.*, by employing a kneading action rather than a violent stirring action.

832,964.—Glass flakes are made by drawing glass in the form of a tube from a supply of molten glass, flattening the tube to form a strip and then shattering the strip below the surface of a liquid to form flakes.

Shorter Abstracts

Tubeless Tyre. 829,509. Esso Research and Engineering Co. Filed, November 18 1957. — A chlorinated butyl rubber inner lining of a tubeless tyre is cemented to a carcass of natural or highly unsaturated synthetic rubber by means of an interposed layer of a blend of 65 to 85% of natural rubber or a synthetic diene rubber and 35 to 15% of brominated butyl rubber. The layer contains also a polyimide, sulphur and zinc oxide.

Perfluorocarbon Polymers. 829,600. E. I. du Pont de Nemours and Co. Filed, August 30 1957.—Copolymers of hexafluoropropylene and tetrafluoroethylene are claimed having a melt viscosity and a combined hexafluoropropylene content within a defined range.

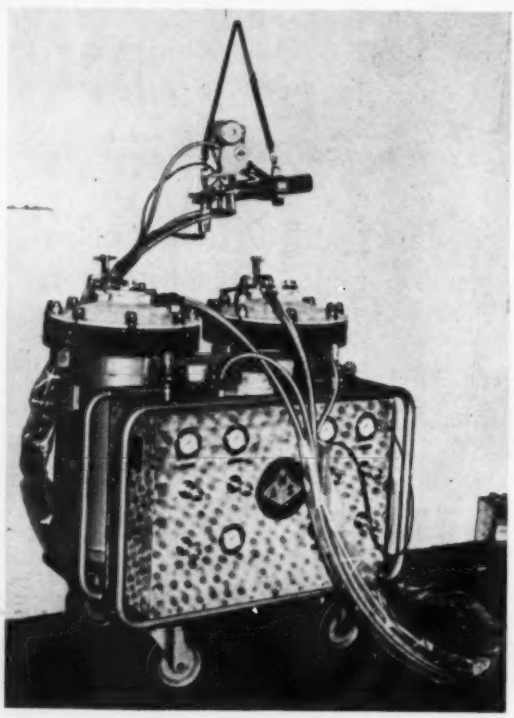
Mats. 829,653. R. G. Freer. Filed, December 13 1957.—A mat of polythene or PVC is formed of links connected together by separable pip and socket joints.

Pelleting Process. 830,237. Imperial Chemical Industries Ltd. Filed, February 28 1958.—Polymers of esters of acrylic or methacrylic acid are used as binding agents for forming pellets of rubber compounding ingredients such as accelerators and antioxidants.

Belting. 830,343. Lewis and Tylor Ltd. Filed, October 21 1957.—Belting comprising a woven fibrous base has the edges reinforced by material in the form of loops, the loops being embedded in a coating material, *e.g.* PVC.

Carbon Black Beads. 830,579. Columbian Carbon Co. Filed, January 20 1958.—The resistance of carbon black beads to crushing and packing is increased by depositing rosin in the surface of the beads.

Cross-linked Latex. 831,197. T.I. (Group Services) Ltd. Filed, January 2 1958.—Natural or synthetic rubber latex is cross-linked and remains in the fluid condition by adding divinyl benzene or other suitable monomer to the latex and then exposing the mixture to high energy irradiation.



The M.A.S. SP1 Junior fibre - resin spraying machine for the simultaneous spraying of several resin components, cut-glass fibres and fillers. The machine combines, in an enclosed unit, the multi-component spray gun and a small fibre-cutting mechanism. The machine is new in this country. All Aust and Schuttler machines are handled in the UK by Metropolitan Plastics, Glenville Grove, Deptford, S.E.8

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Rubber and Plastics Stock Market

A REVIEW OF PRICES AND TRENDS

LADIES and Gentlemen,—Introducing, for the very first time in these columns, the heavyweight champion of the investment world, Derek Heathcoat Amory. 'Derry' to his friends, always comes out fighting from the blue corner. Although he has been in action for a number of years, it is only recently the public and especially the Throgmorton Street set, have come to recognize that he is a knockout specialist of some considerable degree.

On Thursday June 23 he really hit the headlines by declaring that our prime interest rate was to be increased by 1% to 6%. And he crossed with another blockbuster—'special deposits' to be doubled. This combination really knocked the Stock Exchange for six. Staggering under the blow the *Financial Times* industrial ordinary index slumped nearly nine points.

This was the largest single day's fall since September 1957 when the Bank rate was jacked up from 5% to 7%. Then, of course, the index was at a much lower level. But like anyone who is in a fit condition the 'Change was in good enough shape to recover its wits well enough to end the account on Friday looking steadier with many of the top line industrial equities notching up good gains.

Dealers trying to grapple with the full meaning of the new credit measures have tested the mood of investors by widening and lowering quotations. So far, however, little selling has been in evidence. But many feel that the real test lies ahead. At this juncture there seems small reason to suggest that good class shares should be sold. Industry is booming and this latest touch of the brakes shows once more that the government is not prepared to let that old bug inflation get the upper hand again.

From time to time we have mentioned the fact that shares of the important plastic companies have enjoyed a good following. In the ebb and flow of general industrial prices they have been steadily building up and at present they are not far from double the levels of a year ago. Unlike some of the other groups this strength has been based not on optimism alone but on highly favourable trading figures. The kind of impressive progress now being made by this very popular industry was borne out by the Board of Trade. It sent word that net sales of plastic materials reached a new peak of 146,400 tons in the first quarter of this year. The total was 33,000 or more than 29% higher than in the similar period for 1959. The highest rate of expansion continued to be in the thermoplastics section where total sales were 92,000 tons—about one-third more than a year ago.

LAPORTE INDUSTRIES chairman, Mr P. D. O'Brien reports that the

Continued on page 32

Share Price Movements

Par Value	Company	1960 High	Low	June 18	Latest
£1	A.E. Ind. Ord.	67/-	50/3	58/-	53/-
5/-	Albright & W. Ord. ..	31/9	25/9	30/3	28/6
£1	" " " 5% Pref.	17/3	16/-	16/6	16/3
5/-	Anchor Chemical Ord...	18/7½	14/9	15/ 3	15/-
5/-	Andersons Rub. Ord. ..	—	—	3/1½	3/1½
£1	Angus Geo. Ord. ..	47/6	34/9	46/9	45/6
5/-	Ault & Wiborg Ord. ..	25/-	20/-	24/9	23/9
£1	Avon India Rubber Ord.	46/6	35/-	36/-	35/-
£1	" " " 6% Pref.	20/-	17/6	18/9	18/9
10/-	Bakelite Ord.	56/3	39/9	56/3	57/6
£1	" 6% Pref. ..	19/-	16/9	19/-	19/-
£1	Baker Perkins Ord. ..	54/-	49/9	52/3	41/6xc
4/-	Bank Bdg. Rubber Ord.	3/9	2/3	2/3	2/3
4/-	Brammer H. Ord. ..	183/	16/9	18/3	18/3
10/-	Bridge, David Ord. ..	60/-	53/6	59/	59/-
5/-	Bright, John Ord. ..	18/6	15/3	17/4½	17/4½
2/-	Brit. Ind. Plas. Ord. ..	10/6	5/3	10/4½	11/4½
2/-	" 10% (tax free) Pref.	4/9	4/3	4/9	4/9
£1	British Xylonite Ord. ..	103/9	78/9	103/9	97/6
£1	" " 5% Pref.	17/6	15/-	16/9	16/6
£1	BICC Ord.	61/3	50/9	51/9	50/9
5/-	BTR Ind. Ord.	14/3	9/9	14/3	14/3
£1	" " 7½% Pref. ..	24/3	23/-	23/6	23/6
£1	Courtaulds Ord. ..	70/7½	58/9	70/7½	65/3xd
£1	" 5% 1st Pref.	17/9	16/3	16/6	16/6
£1	" 6% 2nd Pref.	21/-	19/4½	19/4½	19/4½
4/-	Cow, P. B. Ord. ..	9/-	6/9	9/-	9/4½
£1	" " 5% Pref. ..	15/6	14/9	15/-	15/-
1/-	Dannimac Mfg. Ord. ..	12/9	10/-	10/3	10/-
10/-	De La Rue Ord. ..	76/3	65/6	77/-	75/-xd
£1	" " " 3½% Pref. ..	12/-	10/9	10/9	10/9
10/-	Distillers Co. Ord. ..	39/9	32/9	39/-	35/9
£1	" " 6% Pref...	22/-	20/6	20/9	20/6
£100	" 5% Conv. Loan	£96	£95½	£96	£96
£100	" 5½% Unsec. Loan	£97	£89½	£89½	£89½
10/-	Dunlop Rubber Ord. ..	28/3	21/9	27/9	25/6
£1	" " 5½% Pref.	19/-	17/-	17/6	17/6
£100	" 3½% 1st Debs.	£78	£74	£75½	£75½
£100	" 4½% 2nd Debs.	£87	£85½	£85½	£85½
£1	Eng. Elect. Ord. ..	53/6	36/3	41/-	36/3
4/-	Ebonite Cont. Ord. ..	14/3	11/3	11/3	11/3
£1	English China Clays Ord.	95/-	74/6	90/6	85/6
£1	Goodyear Tyre 4% Pref.	12/9	11/6	11/9	11/9
5/-	Greeff Chem. Ord. ..	47/6	29/3	47/6	45/-
10/-	Greeff Chem. 5½% Pref.	9/-	8/6	9/-	9/-
5/-	Hackbridge Hldg. ..	17/6	14/9	16/-	15/-

Par Value	Company	1960 High	Low	June 18	Latest
4/-	Greengate & Irwell Ord.	6/6	5/3	5/4½	5/4½
£1	Harrisons & Crosfield Dd.	64/-	51/-	51/9	51/-
1/-	Hunt & Moscrop Ord...	2/9	1/9	2/-	2/-
£1	Imp. Chem. Ord. ..	63/3	56/6	62/6	58/3
£1	" " 5% Pref. ..	18/-	16/6	16/6	16/6
£100	" 4½% Unsec. Loan	£89½	£82	£84	£82
£100	" 5½% Conv. Loan	£96	£175	£196	£190
1/-	Kleemann (O. & M.) Ord.	10/3	8/3	10/3	10/-
£1	" " 6½% Pref.	19/-	17/-	17/9	17/9
2/-	Lacrinoid Prod. Ord. ..	5/-	3/-	3/-	3/-
5/-	Laporte Ind. Ord. ..	32/-	25/3	30/3	27/9xd
£1	" " 7½% Pref.	24/3	23/3	23/3	23/3
£1	Leyland & Birm. Rubber Ord.	57/-	46/3	52/6	50/6
£1	" " " 6% Pref.	19/-	17/6	19/-	19/-
2/-	London Rubber.. ..	14/9	11/-	14/-	12/10½
£1	" 6% Red. Cum. Pref.	20/-	18/9	18/9	18/9
£1	McKechnie Bros. Ord...	71/6	57/-	57/6	57/-
£1	" " 'A' Ord.	69/3	58/9	59/6	59/-
£1	" " 6% Cum. Pref.	18/-	16/-	17/-	17/-
5/-	Monsanto Chem. Ord. ..	28/-	23/3	25/6	24/6
£1	" " 3½% Pref.	12/9	12/-	12/1½	12/-
£100	" " 6% Debs.	£103½	£100	£100	£100
5/-	Miles (H.G.) Holdgs. Ord.	11/3	9/9	10/9	10/9
£1	North British Rubber ..	21/3	17/-	17/-	17/-
5/-	Plastic Enginrs. Ord. ..	25/-	20/-	24/6	24/-
5/-	Redfern Holdings Ord...	5/9	4/3	5/4½	5/3
2/-	RFD Ltd. Ord.	6/6	5/-	5/1½	5/-
£1	" " 5½% Pref. ..	14/6	12/9	13/9	13/9
2/-	Rubber Imp. Ord. ..	7/9	4/6	4/10½	4/9
2/-	" " 'A' Ord. ..	7/-	3/3	3/9	3/6
£1	" " 5% 1st Pref.	15/-	11/3	12/3	12/3
5/-	Rubber Reg. Ord. ..	19/3	17/-	17/9	17/6
4/-	Shaw Francis Ord. ..	27/6	21/3	22/9	22/-
2/-	Silentbloc Ord.	13/3	10/-	11/1½	11/-
5/-	Storey Bros.	36/-	28/3	34/-	33/-
2/-	Sussex Rubber Ord. ..	2/3	1/3	1/11½	1/11½
5/-	Sutcliffe Speak Ord. ..	15/9	11/-	13/6	13/-
£1	Turner & Newall Ord. ..	115/-	100/-	103/3	97/3xd
£1	" " " 7% Pref.	25/-	23/-	23/3	23/3
5/-	Universal Asbestos Ord.	43/9	32/6	43/9	43/-
5/-	Viscose Dev. Ord. ..	16/6	14/9	16/6	16/-
5/-	Warne William (Holdgs.) Ord.	18/6	17/-	17/6	17/-

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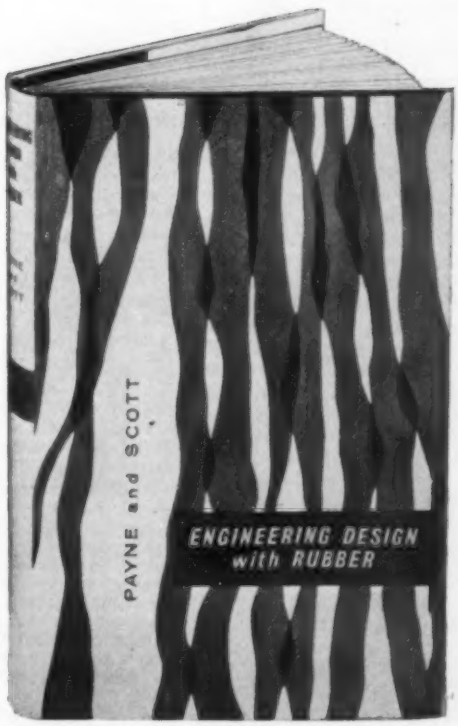

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Rubber Markets

LONDON

Prices moved irregularly downwards in a dull market, in sympathy with lower Eastern levels, following the easing of recent stringency at Singapore for early delivery. Short covering put the July Settlement position up sharply, but it 'closed out' much quieter than had been expected. Distant Terminal positions were rather neglected. Factory demand was small and selective.

Latest prices are as follows:

No. 1 RSS Spot: 36¾d.-37¼d.

Settlement House:

August 34⅞d.-35⅛d.

September 34⅛d.-34⅜d.

October/December 33⅞d.-34⅛d.

January/March 33⅛d.-33⅜d.

April/June 32⅜d.-32⅝d.

July/September 31⅞d.-32⅛d.

No. 1 RSS cif basis ports:

July 34⅞d.-35⅛d.

August 34⅜d.-35d.

September 34⅜d.-34⅝d.

Godown:

July 119¼ cents nominal.

Latex

Centrifuged 60% latex per gallon in drums, seller, July, August, 19s. 6d., September, 19s. 5d., October, 19s. 3d., cif European ports. Spot, seller, 20s. Bulk, nominal, September 19s. 1d. Creamed, seller, August, 19s. 7d. nominal. Normal, seller, July, 15s. 11d.

BANGKOK

No. 1 RSS

The price of No. 1 RSS at Bangkok on June 27 was 39.25 (39.00) US cents per lb.

SINGAPORE

The morning market on June 27 was dull. There was limited interest in No. 1 Sheet for July delivery while lower sheets were neglected. Factories were quiet. Little trading was seen in the afternoon. Only a few enquiries for lower grades were reported. After hours, the market was slightly brighter.

	Malayan cents per lb. fob Malayan ports to open ports	
	June 27	Previous Close
No. 1 RSS, July	123 –123¼	122¾–123
Aug.	122¼–122½	122¼–122⅝
No. 2 RSS, July	121¼–122¼	121¼–122¼
No. 3 RSS, July	119 –120	118¾–119¾
No. 4 RSS, July	117 –118	117¼–117½
No. 5 RSS, July	112 –113	111½–112½
No. 1 Spot ..	123 –123¼	122¾–123
No. 3 blanket, thick, remilled, crepe, July ..	112 –113	112 –113
No. 1 fine pale crepe, July ..	129¼–130½	129¼–130½
2X thin brown crepe, July ..	110¾–111¾	110½–111½

Tone: Slightly steadier.

The Industries Syndicate quote latex, native produce, 60% centrifugal, packed in rectangular drums, fob at 232.40d. per gallon.

CEYLON

No. 1 RSS

The price of No. 1 RSS at Colombo on June 27 was 144¼ Ceylon cents per lb.

NEW YORK

The New York rubber market ruled as under on June 27:

Dealers' Prices

US cents per lb. ex-dock

	June 27	Previous
No. 1 RSS, July ..	44 b–44¼a	43¾a
Aug...	42¼b–42¾a	42¼a
No. 2 RSS, July ..	43¼b–43¾a	43¼a
Aug...	42 b–42¼a	42a
No. 3 RSS, July ..	43¼b–43¾a	43a
Aug...	41¾b–42 a	42a
No. 1 RSS Spot ..	47 b–47¼a	46¾n
No. 3 amber blanket, crepe, Sept. ..	38¼a	39a
No. 1 latex thin crepe, July ..	44¼n	44¼n
No. 1 latex thick crepe, July ..	44¼n	44¼n

Futures—Rex Contract

	Closing	Prev. Close
July ..	46.40t	45.80b–46.10a
September	41.53b–41.60a	41.30t
November	40.15b–40.25a	40.10–40.05t
January ..	39.28b–29.35a	39.15b–39.40a
March ..	38.85b–39.20a	38.75b–39.00a
May ..	38.40b–38.80a	38.30b–38.50a
July ..	38.00b–38.40a	37.85b–38.25a

Sales: 25. Tone: Very steady.

Rubber futures were steadier on June 27, led by the nearby July position. Traders said there was a speculative interest in nearby July because of a possible squeeze developing in that month on the Exchange. Dealings were slight. Physical rubber was termed quiet and steady. Futures were very steady in late dealings.

AMSTERDAM

The Amsterdam rubber market ruled as under on June 27:

	Guilders per kilo	
No. 1 RMA	June 27	Previous
June	3.55½	3.57
July	3.56	3.56
August	3.55	3.55
September ..	3.54	3.54
July/September	3.55	3.55
October ..	3.38	3.39

Sales: 45. Tendency: Quiet.

DJAKARTA

No transactions were reported on June 27 and the market closed dull.

	Rupiahs per kilo June 27
Spot No. 1 Prick	44.00b
Spot No. 2 Prick	43.00b
Spot No. 3 Prick	38.50b
No. 1 fine pale crepe, spot ..	41.00b

Tone: Dull.

STOCK MARKET

Continued from page 30

strong demand for the group's product is continuing. The company is reaping the advantage of having foreseen an increased demand for its products and of having laid down units to manufacture them. Further development of Laporte Titanium is the chief project of a number in view. Another phase of development at the Titanium company's works estimated to cost £3½m. will increase output from 30,000 to 50,000 tons per annum. Net current assets total £5,471,001 (£3,242,320) and Mr O'Brien said that it was anticipated that the development can be financed from existing resources and further earnings. Total net assets of £18.95m. compare with £15.93m. There are outstanding commitments of £560,000 against £280,000. With the report shareholders this year received an illustrated book, 'Raw Materials of Progress,' which described the company, its history and activities. Many of the group's major customers will also receive a copy and employees an abridged edition of it.

Laporte have also made a £2½m. cash offer for the preference and ordinary capital of Peter Spence and Sons. An old-established family business, Spence manufactures a wide range of heavy chemicals, including aluminium sulphate, sulphuric acid, catalysts and organic titanium compounds. In certain respects it was said the business is complementary to that of Laporte. The offer was made in agreement with Mr Derek Spence and his co-directors who have recommended it to shareholders. Acceptance by a majority of shareholders has been assured.

Holders of the outstanding 5½% loan stock of Imperial Chemical Industries are reminded by the company that this month is the last opportunity to convert into ordinary shares. Each £50 of the stock may be converted into 33 £1 ordinary units and the option must be lodged by July 31. It is pointed out that annual interest on £50 of stock is £2 15s. whereas dividend on £33 ordinary stock amounted to £3 14s. 3d. last year. The market price of £50 of stock was £98 15s. on June 13 but that price included the value of the right to convert into ordinary stock. When that right expires the value of the stock will fall to that appropriate to a 5½% loan stock repayable at par in 1977-79. The value of 33 £1 units at the same date was £101 17s. 9d.

Subject to any major disturbance, prospects of the Ault and Wiborg group are hopeful. Sales of the current financial year are considerably in advance of those at the same time last year, says Mr A. J. A. Kennedy, the chairman. The acquisition of indestructible paint is already proving advantageous to the group. Group trading profit for the year expanded from £687,900 to £824,400.

Industry INTELLIGENCE

Technical Data

Silcoset Silicone Rubbers

Silcoset silicone rubbers, of which there are three grades, are room temperature vulcanizing pastes which cure after the addition of a curing agent. They are manufactured by Imperial Chemical Industries, Nobel Division, Silicones Department, Stevenston, Ayrshire, from whom further information, contained in data sheets Si A 35 and Si P Silcoset 100/1/2, may be obtained. They are recommended for use in sealing, patching, caulking and potting applications where extremes of temperature are ultimately to be encountered, and where the components potted are of a delicate nature. They may also be used for the manufacture of moulds for casting resins for model reproduction and low cost tooling. Dissolved in solvent, they can be used for coating by knife spreading or dipping.

Two curing agents can be supplied, one for general purposes, the other giving a long pot life, but producing a material with similar properties to the normally cured.

Although cure may be accomplished at room temperature, higher temperatures may be used to accelerate the process, and are recommended for applications where the product has to withstand temperatures in the region of 250°C. which is the upper limit of stability of the material.

Epikure RTL

Epikote resins 828 and 815 may be cured at room temperature by the use of a new curing agent Epikure RTL specially developed for the production of resin/glass laminates, and small castings. Due to the high exotherm developed this curing agent is not recommended for use in castings exceeding ½in. thick although the incorporation of fillers may allow the successful production of larger blocks. Epikure RTL is a low viscosity straw-coloured liquid, gives a pot life of about 45 minutes in a 25gm. batch at 23°C. and requires similar handling precautions to other amine type hardeners. Further details are given in Preliminary Information Sheet RES/P/4 obtainable from Shell Chemical Company Ltd., 15-17 Great Marlborough Street, London, W.1.

Synpol Synthetic Rubbers

A colourful leaflet has recently been issued by Texas-US Chemical Company, 260 Madison Avenue, New York, 16, whose agents in this country are Chas. Page and Co. Ltd., 52 Grosvenor Gardens, S.W.1. This gives a description, chemical and physical properties, and applications of the range of Synpol butadiene-styrene synthetic rubbers. Listed are ten hot types, five cold, eight cold oil-extended, and seven black masterbatches. The layout enables a comparison between the various types and grades available to be made at a glance, and the most suitable for any particular application to be chosen.

Also recently issued is technical data sheet No. 12, which concerns an addition to the range of masterbatches, Synpol 8259A. This is an oil-extended ultra dispersed black masterbatch similar to 8255B but contains ISAF instead of HAF black. Data given are based on initial production runs and include chemical and physical properties, a description of the material and test conditions, and also the test recipe used.

BHT Antioxidant

BHT is a non-staining antioxidant intended for use in white or pale coloured stocks. The recommended level of use is 1-2phr and at this level it confers a high degree of resistance to oxidation and copper degradation, is non-blooming and, being non-toxic, can safely be used in contact with foodstuffs. BHT can also be satisfactorily used as a non-staining stabilizer for SBR. Chemical composition of this material is 2,6-di-tertiary-butyl paracresol and further details of the results of bomb, accelerated ageing and copper inhibition tests, and of physical properties are given in laboratory report No. LA3/1 issued by Monsanto Chemicals Ltd., Monsanto House, 10-18 Victoria Street, S.W.1.

Machines, Materials and Equipment

Porous Plastic Material

A permeable material of medium pore size has been produced from high-density polythene of the Ziegler type. It is manufactured in such a way that different porosity characteristics can be provided to meet specific requirements. It is made in the form of sheets, up to 32in. square and 0.03 to 0.2 thick, of controlled and uniform permeability. The maximum permeability of a sheet ½in. thick is about 50 cu. ft. of air per sq. ft. per minute, at a pressure of 0.25lb. per sq. in.

This new material has advantages over conventional porous materials in that it is flexible, mechanically strong, and light in weight, as well as being non-absorbent and easy to clean. It can readily be fabricated into various shapes, including tubes, and can be drilled and machined.

Modular Storage Tray

Multiple compartment trays for storing small components may be assembled from kits of parts which are commercially available. Five standard component units are used, and these may be built up to form varied configurations of compartments each 1⅛in. square by ½in. deep. All internal corners are rounded to facilitate removal of small items.

The components are moulded from high impact strength polystyrene, and dovetailed together to form a self-supporting assembly.

New Publications

Floor Warming

Tyrad Electric have produced a new leaflet giving details of their embedded system of heating. Calculations, technical data and prices are sufficient to enable any contractor to work out a complete installation.

At the same time the company announce a new former for retaining the heating cables in position during installation. This is made from extended T-section PVC and is slotted at intervals to take the heating cables; it can be removed after installation of the wires and re-used.

Laporte Raw Materials

A colourful and somewhat modernistic booklet has been issued by Laporte Industries Ltd., which tells the story of the group's activities, and is produced in the interests of better knowledge of the British chemical industry and its work.

'The Raw Materials of Progress,' which is the title of the booklet, gives a brief history of the group which has grown from a peroxide plant established at Shipley in the 1880s to a £20m. concern with 4,000 employees and 16 production units in this country, Australia and Canada.

The products of the group are described and these include acids, general chemicals, fullers earth, hydrogen peroxide and titanium oxide. Of these the last named has risen in fifteen years from being a little known material to forming an important constituent of a very wide range of everyday products such as paper and paint, rubber and plastics.

The book continues with a forecast for the future and this concludes: 'Research and development . . . manufacturing technology . . . expansion overseas . . . management and men . . . money and materials . . . all of those and many more provide the intangible raw materials of the technical progress of tomorrow. It is through them and what they will produce, that Laporte will make its contribution to industrial prosperity and the future.'

Synthetic Rubber Prices

Prices of synthetic rubbers appear regularly in Rubber Journal and International Plastics *in the first week of each month. It will be appreciated if suppliers will give notification of any price changes or additions to their range. Cif duty paid quotations are subject to slight variation due to exchange, ocean freight and insurance fluctuations. Prices are in pence per lb., except where otherwise stated. Grades are expressed as follows:* 1001/2/6 = *grades* 1001, 1002 *and* 1006.

(e-qdp)—Ex-quay duty paid (cif UKdp)—cif UK duty paid (e-i)—Ex-installation (ddp)—Delivered duty paid (e-sUK)—Ex-store UK (ex-wUK)—Ex-warehouse UK (d)—Delivered BM—black masterbatch CBM—cold, black masterbatch CNP—cold, non-pigmented CNS—cold, non-staining COE—cold, oil extended COELC—cold, oil extended, light coloured CO/BM—cold, oil/black masterbatch CPOE—cold, pigmented, oil extended CRE—cold, rosin extended dw—Dry weight HN—high nitrile HNP—high nitrile, powder HP—hot, pigmented HS—high styrene HMW—high mol. wt. LMW—low mol. wt. MHN—medium high nitrile MLN—medium low nitrile MMW—medium molecular weight MN—medium nitrile NS—non-staining TS—total solids RTV—room temp. vulc.

SBR TYPES AND HIGH-STYRENE RUBBER

Ameripol (Goodrich Gulf) (e-qdp)
(min., 70,000-lb. lots)

1000/1	Hot, Non-Oil	23.1
1002/6/7	,, ,,	23.34
1009/11	,, ,,	23.71
1012	,, ,,	23.24
1013	,, ,,	23.94
1500/1/2	Cold, Non-Oil	23.1
1703	COE, 25% Oil	*20.31
1705	,, ,,	*20.07
1707/8	,, 37.5% Oil	*18.89
1710/12	,, ,,	*18.66

*Under 70,000 lb., min. 600 lb.

ANIC (cif UK dp)

1500	22.25
1502	22.50
1708	18.00
1712	17.75

ASRC (American Synthetic Rubber Corpn.) (cif UKdp*)
(carloads lots of 30,000 lb.)

1000/1/4/6	Hot, Non-Oil	23.99
1009	,, ,,	24.61
1018	,, ,,	26.74
1019	,, ,,	26.26
1500/2	Cold, Non-Oil	23.99
1503	,, ,,	26.02
3110	,, ,,	25.78
1703	COE	20.69
1708	,,	19.27

*US/£ conversion rate $2.80

Cariflex (Shell Chemical) (e-sUK)

S-1000	Hot	22.25
S-1002	,,	23.375
S-1006	,,	22.25
S-1009/11/13	,,	24.0
S-1100	Hot/black	19.75
S-1500/2/9	Cold	22.25
S-1600/2	Cold/black	19.625
S-1605	,, ,,	19.375
S-1703	COE	20.25
S-1707	,,	18.0
S-1709/12	,,	17.75
S-1803	COBM	17.875

FR-S (Firestone) (esUKdp*)

1000/1/4/6/7	Hot	22.25
1500/2	Cold	22.25
146	,,	22.25
1710/12	OE	17.75
184	,,	17.75
178	,,	18.0
1009 cif UK	Specialty	24.75
1010	,, ,,	26.0
1012	,, ,,	24.25
1013	,, ,,	25.0
1014	,, ,,	28.125
1015	,, ,,	28.75
141	,, ,,	28.625
181	,, ,,	24.125
182	,, ,,	25.0
158	,, ,,	29.5

*US/£ conversion rate $2.80

Int. Synthetic Rubber (d)

Intol 1500/2	22.5
Intol 1006	22.5
Intol 1710	18.0
Intol 1712	18.0
Intol 1778	18.25
	(ex-wks TS)
Intol Latices R23/M23	22.25

Naugapol (Naugatuck Chemical) (e-sUK)

1016	28.0
1018	28.5
1019	28.0
1022	30.75
1023	32.75
1503	27.75
1504	34.0
6101	26.25
6102	27.75
K-45	30.5
K-50	31.25
KO-50	29.0

Philprene (Phillips) (e-qdp*)

1000/1/6	Hot, Non-Pig	23.28
1009	,, ,,	24.69
1010	,, ,,	25.86
1018	,, ,,	26.80
1019	,, ,,	26.33
1100	HP	19.65
1104	,,	19.28
1500/2	CNP	23.28
1503	,,	26.1
1601	CP	19.56
1605	,,	19.28
1703	COE	20.23
1706	,,	19.94
1708	,,	18.82
1712	,,	18.58
1803	CPOE	17.78
1805	,,	15.99

*US/£ conversion rate $2.81½

Plioflex (Goodyear) (ex-wUK)

1006	HNP	22.25
1500/2/7/8	CNP	22.25
1006	S	22.75
1703	COE	19.25
1710/12	,,	17.75
1773	COELC	19.25
1778	,,	18.0
B—6		27.5
B—5		28.0

Polysar (Polymer UK) (e-sUK)

S Hot	22.25
S-630 Hot	22.25
Kryflex 200 Cold	23.5
Krylene	22.25
Krylene NS	22.25
Krylene 602 Cold	22.25
Krynol 651 COE	17.75
Krynol 652 ,,	18.0
S-X 371 Process Aid	24.0

Synpol (Texas-US Chemical) (e-qdp)

1000/1	Hot	22.25
1002	,,	22.47
1006/7	,,	22.25
1009	,,	22.81
1012	,,	22.38
1013/61	,,	22.25
X274	,,	23.45
8000	,,	22.25
1500/02/51	Cold	22.25
1703	COE	19.25
1707/8	,,	18.0
1711	,,	17.88
1712	,,	17.75
8200	,,	18.0
8201	,,	16.6
8202	,,	16.38
8152	CBM	18.6
8151	COBM	18.2
8253	,,	15.84
8254	,,	15.45
8255	,,	14.8
8267	,,	16.4

(Masterbatch prices US cents per lb. fas Gulf ports)

SBR LATICES

Copo (Copolymer) (cif UKdp)
(10-ton lots)

2101	(dw)	46.3
X-765	,,	40.8
X-800	,,	37.2
2102/5	,,	38.0

Naugatex (Naugatuck Chemical) (ex-wUK)

J8174	39.5
2000/1/2	40.0
2006	48.5
2105/7	40.0
2108	42.25
2711/4	39.75
2733/4	40.25
2740	45.25
J8535	38.75
2113	39.25

Pliolite Rubber (Goodyear) (d)

2000	40

Latex (dw)

2001/4/5/8	40
5350	40

Pliolite Resin (Goodyear) (d)

101A	(dw)	44
150	,,	50
151	,,	35
160	,,	50
170	,,	50

Hycar (B. F. Goodrich) (ddp)

2507 (HS) dw	48

Polysar (Polymer UK) (e-sUK)

Latex, type IV	32.5 TS
Latex, type 722	31.75 TS
(Non-returnable 45-gallon drums)	(e-i)
Latex, type 722 (bulk quantities)	28.75 TS

Int. Synthetic Rubber (ex-wks)

Intol Latex R23/M23	22

Dylex (Koppers Int. CA) (fas)

K-42A/52/31/900	31.6

ACRYLONITRILE TYPES

Butaprene N (Firestone) (cif UKdp)

NL	52.5
NAA	56.25
NF	51.5
NXM	60.18

Chemigum (e-s)

N—1	75
N—3A	52
N—5	52
N—6G/7/8/600X	45

Hycar (British Geon) (UKd)
(500-lb. lots and over)

1001	High Nitrile Hot	52
1041	,, ,, Cold	52
1002	MHN Hot	45
1042	,, Cold	45

Hycar (B. F. Goodrich) (ddp)
(500-lb. lots and over)

1411	HNP	66
1432	MHN (crumb)	64
1072	,, (carboxyl)	66
1312	,, (liquid)	55
1043	MLN	51
1014	Low Nitrile	61

I.C.I. (min., 5-cwt. lots) (UKd)

Butakon A-4051 HN Cold	52
Butakon A-3051 MN Cold	45
Butakon A-3002 ,, ,,	45

Paracril (US Rubber) (dwe-sUK)

18-80	Low Nitrile	61
AJ	,, ,,	50
B	MLN	51
BJ	,,	51
BLT	,, Cold	51
BJLT	,, ,,	51
C	MHN	59
CLT	,, Cold	59
CV	,, (crumb)	63
D	High Nitrile	67
ALT		51
OZO		47

Polysar (Polymer UK) (d)

Krynac 800 MN	45
Krynac 802 LN	45
Krynac 803 MN (low Mooney)	45
Krynac 801 HN	52
Krynac 804 (MN-cross linked)	45

ACRYLONITRILE LATICES

Buta prene N (Firestone) (cif UKdp)

N-300 (dw)	53
N-400 ,,	60.5

Chemigum Latex (Goodyear) (d)

200	(dw)	65
235/6	CHS ,,	60
245	B ,,	52
245/6/7/8	CHS ,,	52

Hycar (B.F. Goodrich) (ddp)
(dry weight, drum lots)

1551 High Nitrile	66
1552 MHN	57

Hycar (British Geon) (UKd)
(dry weight, 3 drums and over)

1561	High Nitrile	60
1571	,, ,, (carboxyl)	60
1562	MHN	52
1577	,, (modified)	52

Nitrex (Naugatuck Chemical) (e-sUK)

J6849	56.75
2612	53.75
2616	63.0
2619	62.75
2620	55.5
2625	54.5
2625-A	54.5

ACRYLIC TYPES

Hycar (B. F. Goodrich) (ddp)

4021 Slab, 500 lb. and over	144
4501 Latex, dry weight	96

BUTYL TYPES

Esso (e-sUK)

Regular 035/150/215	21.75
Regular 217/8	21.75
Regular 325	21.75
Non-staining 065	22.75
Non-staining 165	22.75
Non-staining 265/7/8	22.75
Non-staining 365	22.75

Vistanex (Polyisobutylene) (e-qdp)

MS LMW	54
MH ,,	54
L-80 MMW	54
L-100 ,,	54
L-120 ,,	54
L-140 ,,	54

Polysar (Polymer UK) (e-sUK)

Butyl 100/200/300		21.75
Butyl 301/400	NS	21.75
Butyl 101	NS	26.25
Butyl 402	NS	22.5

Hycar (B. F. Goodrich) (ddp)
(500 lb. and over)

2202 Brominated	68

NEOPRENES

		(ddp)
W and WHV	(dwdel)	42.62
WRT	,,	48.37
WX/GN/GNA	,,	44.62
GRT and S	,,	45.62
AC	,,	57.125
KNR	,,	75.62
AC 'M' and 'S'	,,	57.125
CG/AD	,,	57.125

Latices—Dry
(per lb. del, min., 50 lb.)

571	49.75
842A	49.75
572	51.25
601A	51.87
650	54.125
735	51.25
736	51.25
950	58.25
60	51.87
750	51.25
635	53.62

SILICONE RUBBERS

Midland Silicones
(500-lb. lots del)

Stocks	16s. 6d. to 35s.
Pastes	26s. to 35s.
Gums and base stock	36s. to 42s.
Cold-curing silicone rubber	20s. and 23d. 6d.

I.C.I. Silicones

Gums (40-lb. lots del)	39s. 6d.-47s.
Stocks (250-lb. lots del)	22s.-35s.
Pastes (1000-lb. lots del)	27s. 6d.-35s. 9d.
Silcoset (RTV) (250-lb. lots del)	21s. to 24s.

REINFORCING RESINS AND RUBBERS

I.C.I. (min., 2-ton lots) (UKd)

Butakon S-8551	36.5
Butakon S-7001	33.5

Hycar (B.F. Goodrich) (ddp)

2007 (powder)	42.5

Pliolite (Goodyear) (d)

S—6B	36.5

Polysar (Polymer UK) (e-sUK)

SS-250 HS (bale)	27.25
SS-250 ,, (flake)	27.5
Kryflex 252 HS	25.5
Kryflex 202 (HMW Cold polymerized)	25.75

Cariflex (Shell) (e-sUK)

SP-103	28.0

Cyclite (Durham Raw Materials) 42

HYPALON (ddp)

20	48
30	60.25
40	50.75

TRADE MARKS

Objections to the registration of any of the undermentioned applications may be lodged with the Comptroller-General of Patents, Designs and Trade Marks at the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, within one month of the date mentioned. The objections must be stated on Trade Marks Form No. 7, cost £2, obtainable through any money order office. The extracts—from 'The Trade Marks Journal'—given below are reproduced by permission of the Controller of H.M. Stationery Office.

LI-LEX (787,920 and 787,922) Plastics in the form of powders, pastes, liquids, pellets, emulsions, dispersions and granules and being for industrial use. All goods included in Class 12 made of plastics. P. B. Cow (Slough) Ltd., 470 Streatham High Road, London, S.W.16. (Classes 1 and 12; March 22 1960).

PONYTAIL (779,905) Toilet articles included in Class 3 made wholly or partly of leather, plastics, textile materials, rubber, bone or of common metal. Leon Daniel Miller and Milton M. Miller, trading as Standard Products, 741 West Front Street, Plainfield, New Jersey, USA. Address for service is c/o Mewburn Ellis and Co., 70-72 Chancery Lane, London, W.C.2. (Class 3; April 5 1960).

MANUPLEX (797,638) Pipes, tubes, couplings and valves, all of plastics and being for use in conjunction with milking machines. Aktiebolaget Manus, Lindövägen 7-9, Norrköping, Sweden. Address for service is c/o Cruikshank and Fairweather, 28 Southampton Buildings, Chancery Lane, London, W.C.2 (Class 7; April 5 1960).

PORTACRATE (B795,219) Crates made wholly or principally of rubber or of plastics. Robert Morton and Co. Ltd., Trent Works, Burton-on-Trent, County of Stafford. (Class 7; April 5 1960).

PLASTOVAC (797,219) Plastics in the form of sheets, rods, tubes, strips and shaped pieces, and articles made from the aforesaid goods, all included in Class 17, but not including vacuum cleaner hose or any goods of the same description as vacuum cleaner hose. Storey Bros. and Co. Ltd., White Cross Mills, White Cross Street, Lancaster. (Class 17; April 5 1960).

SANDRAN (799,267) Sheet material made of polyvinylchloride plastics for use in the manufacture of floor coverings, table tops, drawer linings and the like. Sandura Co., Benson East Township Line and Old York Road, Jenkintown, Pennsylvania, USA. Address for service c/o Mewburn, Ellis and Co., 70-72 Chancery Lane, London, W.C.2. (Class 17; April 5 1960).

ENDURAIL (B790,606) Handrails made of plastics. The Safety Tread Ltd., Crown Wharf Ironworks, Dace Road, Old Ford, London, E.3. (Class 19; April 5 1960).

COLIDETTE (787,933) Screening curtains made of plastics. Wilfred Ernest George Collins, 8 Malvern Drive, Woodford Green, Essex. (Class 24; April 5 1960).

TERANETTE (793,242) Curtain fabrics, being textile piece goods made wholly or substantially wholly of polyester fibres. Vita-Tex Ltd., Trading Estate, Slough, Buckinghamshire. (Class 24; April 5 1960).

VEXAR (795,241) Textile piece goods made wholly or principally of plastics. E. I. Du Pont De Nemours and Co., 1007 Market Street, Wilmington, USA. Address for service is c/o Marks and Clerk, 57 and 58 Lincoln's Inn Fields, London, W.C.2. (Class 24; April 5 1960).

EASTOZONE (792,634) Antioxidizing agents and antiozonants being chemical substances for use with lubricating oils, motor fuels, mineral oils, synthetic resins and with natural and synthetic rubber. Eastman Kodak Co., 343 State Street, Rochester, New York. Address for service is c/o L. E. T. Branch, Patents and Trade Marks Dept., Kodak Ltd., 1-4 Beech Street, London, E.C.1. (Class 1; April 12 1960).

EVO-STIK (798,658) Adhesive materials (stationery) and paint brushes. Evode Ltd., Common Road, Stafford. (Class 16; April 12 1960).

POLLY BOARD (B787,775) Thermal insulating materials in board form and made of expanded polystyrene plastics. Unilock Partitions Ltd., Rutherford Way, Crawley, Sussex. (Class 17; April 12 1960).

"BETTINA" (797,214) Combined sinks and draining boards, all made of plastics. Bettina Plastic Products Ltd., 37 George Street, Baker Street, London, W.1. (Class 19; April 12 1960).

DEKKO (791,749 Drawers made of plastics for fitting to cabinets, shelves, tables and the like; and fixing-slides and lids for such drawers, all made of plastics. Scrubb and Co. Ltd., Wimbledon Factory Estate, Morden Road, Wimbledon, S.W.19. (Class 20; April 12 1960).

POLYFAB (798,047) Textile linings (in the piece) for underclothing; and textile piece goods for making up into brassieres, corsets, corselettes, girdles, and into underclothing for women. International Latex Corp., Playtex Park, Dover, Delware, USA. Address for service is c/o Stevens, Langer, Parry and Rollinson, 5 to 9 Quality Court, Chancery Lane, London, W.C.2. (Class 24; April 12 1960).

DIMPLES (795,402) Baby pants of plastics. Erica Products Ltd., 147-149 Kensal Road, London, W.10. (Class 25; April 12 1960).

NEW COMPANIES

Commercial Plastics Manufacturing Ltd. (659,289).—May 16. Capital: £100 in £1 shares. The directors are: Lionel Phillips, 15 Russell Hill, Purley, Surrey; William K. Phillips, 5 Totnes Walk, N.2. Regd. office: Willington Quay, Wallsend, Northumberland.

B. A. Manchester and Co. Ltd. (659,661). May 18. Capital: £2,000 in £1 shares. To carry on the business of manufacturers of and dealers in water and rainproof coats, etc. The directors are: Barry A. Manchester and Barbara M. Manchester, both of 'Durham House,' Walnut Grove, Radcliffe on Trent, Notts.; Doris Manchester, 'Lamcote House,' Radcliffe on Trent, Notts. Regd. office: Oaklea Mills, Oakleys Road, Long Eaton, Derbys.

David Millington Ltd. (659,681).—May 18. Capital: £100 in £1 shares. To carry on the business of designers and producers of packages of all kinds, etc. The directors are: David V. H. Millington, 8 Bourne End, Hornchurch, Essex; Terence Brown, 11 Benets Road, Hornchurch; Ronald Keil, Niicassa, Potash Road, Billericay. Regd. office: 8 Bourne End, Hornchurch, Essex.

Nu-Symbols Ltd. (660,140).—May 23. Capital: £2,000 in £1 shares. To carry on the business of manufacturers of and dealers in all kinds of plastic, etc. The directors are: Ernest G. Bridge, Heath End, Bower Heath, Harpenden; Frederick A. Bridge, Post Office Stores, Newton Longville, Bletchley. Regd. office: Post Office Stores, Newton Longville, Bletchley.

Stuart Dean Ltd. (659,818).—May 19. Capital: £100 in £1 shares. To carry on the business of dealers in leather and cloth goods, rubber goods, etc. Stuart Dean, of 23 Stafford Court, W.8, is the first director. Regd. office: 62/4 Temple Chambers, Temple Avenue, E.C.4.

Timecarry Ltd. (659,953).—May 20. Capital: £100 in £1 shares. To carry on the business of manufacturers of and dealers in tyres, etc. Secretary: Thomas A. Herbert, 156 Strand, W.C.2.

3-D Plastics Ltd. (659,952).—May 20. Capital: £100 in £1 shares. To carry on the business of manufacturers of and dealers in technical and domestic plastics, etc. The directors are: Anthony C. Anselm, Sylvan, Oatlands Chase, Walton-on-Thames; Frederick B. Young, 28 Lynwood Close, Woking. Regd. office: Sheerwater Trading Estate, Alban Road, Woking.

Ardlene Ltd. (659,967).—May 20. Capital: £100 in £1 shares. To carry on the business of manufacturers of and dealers in plastics, etc. The first directors are to be appointed by the subscribers. Solicitors: Stanley Laufer, 12 South Square, W.C.1.

Wovit (Fibre) Ltd. (602,284).—Manufacturers of vulcanized fibres, plastics, electrical insulating materials, etc., 61-81 Eastmoor Street, S.E.7. Increased by £10,000, in £1 ordinary shares, beyond the registered capital of £2,000.

Brooklands Selangor Rubber Co., Ltd. (108,735). 73-5 Mortimer Street, W.1.—Increased by £240,500, in 2s. ordinary shares, beyond the registered capital of £565,000.

Stephens (Plastics) Ltd. (572,598). Seafield, near Corsham, Wilts.—Increased by £5,000, in £1 "A" ordinary shares, beyond the registered capital of £2,000.

Gula Investments Ltd. (109,982). 30-33 Minories, E.C.3.—Increased by £750,000, in 5s. shares, beyond the registered capital of £750,000.

Durie and Miller Ltd. (162,288). General india rubber processors, etc., Haslingden, Rossendale, Lancs.—Increased by £100,000, in £1 ordinary shares, beyond the registered capital of £50,000.

Kuala Lumpur Rubber Co., Ltd. (88,831). 53 Eastcheap, E.C.3.—Increased by £750,000, in £1 ordinary shares, beyond the registered capital of £1,250,000.

Sagga Rubber Co., Ltd. (81,976). 5 Laurence Pountney Hill, E.C.4.—Increased by £20,000, in 2s. ordinary shares, beyond the registered capital of £100,000.

Plugmay Ltd. (660,277).—May 24. Capital: £100 in £1 shares. To carry on the business of manufacturers of and dealers in tyres, etc. The first directors are to be appointed by the subscribers. Secretary: Thomas A. Herbert, 156 Strand, W.C.2.

Neve Plastics Co. Ltd. (660,462).—May 25. Capital: £1,000 in £1 shares. The directors are: Samuel H. Neve and Kenneth Neve (plastic sign manufacturers), both of 8 Rothschild Road, W.4. Regd. office: 8 Rothschild Road, W.4.

Tonbridge Plastics Ltd. (660,471).—May 25. Capital: £2,000 in £1 shares. To carry on the business of manufacturers of and dealers in plastics, etc. The directors are: Leonard F. Moore and Mrs. Dorothy M. Moore, both of Apple Acre, London Road, Southborough. Regd. office: 6 Hanover Square, W.1.

Ansel Plastics Ltd. (660,734).—May 27. Capital: £100 in £1 shares. To carry on the business of manufacturers of and dealers in plastics, etc. The directors are: Arthur Aynsley, 15 Beehive Lane, Welwyn Garden City; Charles R. Seales, 12 Great North Road, Welwyn Garden City; Arthur Seales. Regd. office: 150 Great North Road, Hatfield.

Increases of Capital

Nagolle Holdings Ltd. (644,780). Rubber and tea planters, etc., 10 Old Jewry, E.C.2.—Increased by £138,758 in 5s. ordinary shares, beyond the registered capital of £100. The company was converted into "Public" on January 1, 1960. The 555,432 issued shares of 5s. have been converted into stock (5s. units).

Doloswella Holdings Ltd. (644,746). Rubber and tea planters, etc., 10 Old Jewry, E.C.2.—Increased by £230,300, in £1 ordinary shares, beyond the registered capital of £100. The company was converted into "Public" on January 1, 1960. The 230,400 issued shares have been converted into stock (£1 units).

Sarena Plastics (Southern) Ltd. (608,042). 52-4 Grays Inn Road, W.C.1.—Increased by £500, in £1 ordinary shares, beyond the registered capital of £500.

These Jerricans, made from Shell's Carlona high-density polythene, can carry most liquids, from milk to heavy oil. They are blow-moulded by Kingston Mouldings Ltd., of Kingston upon Thames, in three sizes: one-, two- and five-gallon

PATENT LIST

Printed copies of the Specifications in the following list, published by permission of the Controller of H.M. Stationery Office, can be obtained from the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, price 3s. 6d., including postage, but about six weeks after the date of this publication will usually elapse before they come available. Orders with remittance may be sent in advance to the Patent Office, and will be fulfilled immediately the Specifications are published.

COMPLETE SPECIFICATIONS ACCEPTED

Open to public inspection on July 7 1960

Farbwerke Hoechst Aktiengesellschaft Vorm. Meister, Lucius and Brüning. Process for the decomposition of linear esters based on aromatic dicarboxylic acids by means of hydrolysis or analogous reactions. 839,371.

Farbwerke Hoechst Aktiengesellschaft Vorm. Meister, Lucius and Brüning. Process for the antistatic finsh of textile materials consisting wholly or partly of hydrophobic synthetic fibres. 839,456.

Minnesota Mining and Manufacturing Co. Glass articles. 839,769.

Elektrochemisches Kombinat Bitterfeld Veb. Process for stabilizing high polymer halogen containing ethylene-derivatives and their mixtures and copolymers, with other polymerizable organic compounds. 839,852.

Dielektra A.G. Production of laminated bodies. 839,459.

Farbwerke Hoechst Aktiengesellchaft Vorm. Meister, Lucius and Brüning. Resin compositions and a process for their manufacture. 839,460.

British Visqueen Ltd. Bonded sheet materials. 839,855.

Rohm and Haas Co. Unsaturated thioureido ethers, polymers thereof and process of making them. 839,856.

Rohm and Haas Co. Preparation of vinyl thioethers. 839,857.

General Electric Co. Polycarbonate resins and their preparation. 839,858.

Farbwerke Hoechst Aktiengesellschaft Vorm. Meister, Lucius and Brüning. Process for colouring plasticised polyvinyl chloride or lacquers and printing inks. 839,634.

Monsanto Chemical Co. Production of polymers. 839,378.

J. B. Brennan. Castings. 839,556.

M. A. Coler. Synthetic resin moulding compositions. 839,869.

Lonza Electric and Chemical Works Ltd. Thermoplastic synthetic substances. 839,204.

Phillips Petroleum Co. Polymerization process and products thereof. 839,007.

Rohm and Haas Co. Preparation of thioethers. 839,561.

Phillips Petroleum Co. Process and apparatus for recovery of plastic material from solution. 839,562.

Inventa Aktiengesellschaft für Forschung und Patentverwertung. Process for the prevention of discolouration of shaped articles from polyamides by natural or artificial food dyestuffs. 839,566.

Farbwerke Hoechst Aktiengesellschaft Vorm. Meister, Lucius and Brüning. Process for drying fibrous material of highly polymerized aromatic polyesters. 839,130.

W. Buss. Press for the manufacture of mass produced articles from hardenable plastics. 839,577.

Imperial Chemical Industries Ltd. Polymerization of ethylenically unsaturated compounds. 839,884.

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Devoe and Raynolds Co. Inc. Polyester resins from dicarboxylic acid anhydrides and monoepoxides. 839,773.

W. W. Triggs (Grinnell Corporation). Method of treating polytetrafluoroethylene and to polytetrafluoroethylene so treated. 839,966.

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